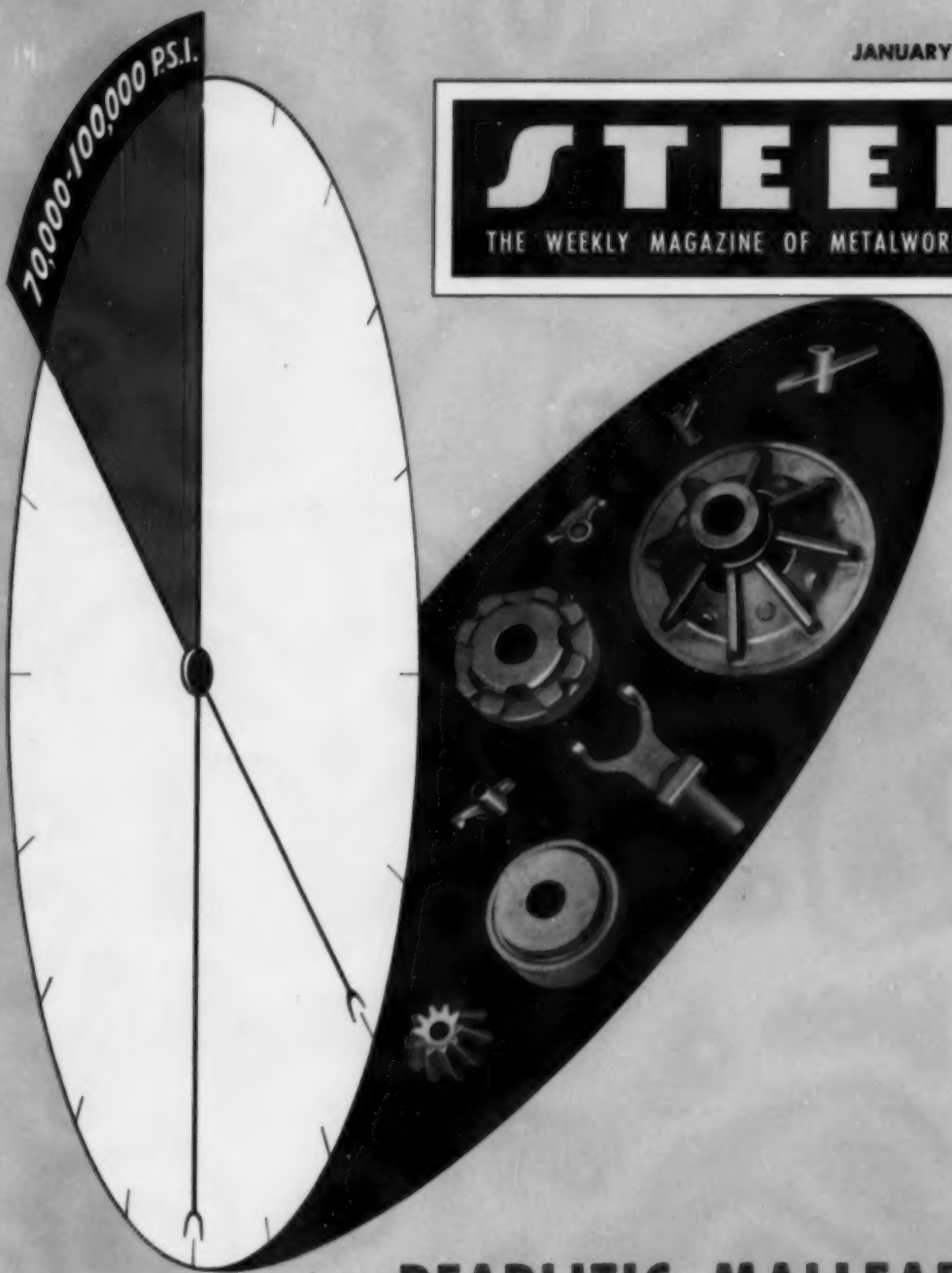
JANUARY 10, 1955

STEEL
THE WEEKLY MAGAZINE OF METALWORKING



PEARLITIC MALLEABLE: Castings for Tougher Jobs

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✔ **TREND IN HANDLING**
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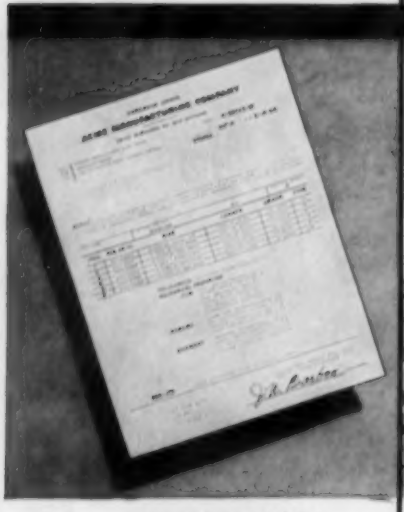
A AVAILABILITY
S SERVICE
Q QUALITY

you get all three with

B & W CARBON STEEL

SEAMLESS

MECHANICAL TUBING



A AVAILABILITY

Buying convenience through a single source of hot-finished and cold-finished carbon steel tubing, produced in a wide range of grades and sizes.

S SERVICE

You can save through the dependable assistance of B&W Regional Representatives and qualified distributors, trained to help solve fabrication problems and to assist in tube selection.

Q QUALITY

Mechanical properties, machinability, tolerances and surface finishes combined for ease of fabrication in your specific application.

remember A S Q *is meant for you.*

B&W SEAMLESS and WELDED TUBES

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

TA-4048 (CSM)

His Specialty Is Speed

When steel men discuss bar mills, you sometimes hear them say, *the faster the mill the better the mill.* What they mean is this: the faster the billet passes through the mill, the easier it is to maintain the desired temperature of the finished bar. And that's important, because consistent temperature-control ensures finished bars of uniform size and section.

The man shown here is a real specialist in speed. He's the "speed operator" at one of the fastest bar mills in the country—Bethlehem's high-speed continuous 10-inch bar mill at the Lackawanna, N.Y., plant. This mill can hot-roll a 30-foot, 4 x 4-inch billet into, say, 1-inch rounds in less than two minutes, delivering the finished bars to the coilers or the cooling beds at a speed of about 2400 ft per min.

The job of setting up the right speed for each of the eighteen pairs of rolls, and synchronizing the rapid flow of steel through these rolls, is the speed operator's primary responsibility. That's why he has to be thoroughly trained, experienced, alert.

Good men working with good equipment, that's the formula for a top-notch product—like Bethlehem Hot-Rolled Carbon Bars.

As a user of carbon bars, you will be interested in a 32-page booklet, "Guide for Selection of Carbon Steel Bars," prepared by our metallurgical staff. It gives you the basic information needed to choose the type and grade of carbon bars that will best meet your requirements, and includes 6 pages of helpful engineering data sheets. Write to us, attention of Publications Department, for your free copy.

And when you're in the market for hot-rolled carbon bars, we suggest that you place your order with the Bethlehem sales office nearest you.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM HOT-ROLLED CARBON BARS

STANDARD SECTIONS • SPECIAL SECTIONS • BAR SIZE SHAPES

BETHLEHEM STEEL

RELY ON PHILLIPS FOR DEPENDABLE SUPPLY!

Philgas* IS AMERICA'S LARGEST SELLING BRAND OF **LP-GAS!**

CLEAN. There is no cleaner fuel than Philgas! Free from harmful contaminants.

UNIFORM. Processed to exacting standards. Uniform thermal value and gravity.

HIGH HEAT CONTENT. Philgas gives you plenty of heat for each fuel dollar!

AUTOMATIC. You get any desired pressure, constant temperatures and atmospheres . . . automatically! Cuts labor costs.

● The storage facilities, pictured above, are part of Phillips Petroleum Company's many installations which help assure you of a dependable, year-around supply of Philgas. Pipelines carry Philgas to strategically situated underground storage facilities, with capacity of hundreds of thousands of barrels. In this manner Philgas, produced in summer, is available to meet peak demands of the winter months.

Many of this nation's leading industries are installing their own Philgas systems for core baking, mold drying, heat treating of all kinds, ceramic operations, food processing, textile finishing, metal cutting, space heating and scores of other uses. Philgas is also used as a motor fuel by many of these same industries.

Phillips experienced field-trained LP-Gas engineers will be glad to consult with you and show you how you can cut operating expenses by changing to this clean-burning, all-purpose fuel.

*Philgas is the Phillips Petroleum Company trademark for its high quality propane-butane LP-Gas or bottled gas.

Phillips 66 Philgas
THE ALL-PURPOSE FUEL

PHILLIPS PETROLEUM COMPANY

Sales Department · Bartlesville, Oklahoma

Offices located in Amarillo, Tex., Atlanta, Ga., Chicago, Ill., Denver, Colo., Des Moines, Ia., Indianapolis, Ind., Kansas City, Mo., Minneapolis, Minn., New York, N. Y., Omaha, Nebr., Raleigh, N. C., St. Louis, Mo., Tampa, Fla., Tulsa, Okla., Wichita, Kans.

"Where welding work calls for **D.C. Rectifiers**—you'll want to check the many advantages of the...

New HOBART D C Rectifier Welder"

Special built-in features bring easy arc control... greater speeds and BETTER WELDS!

You'll want to compare Hobart, feature for feature, to see the real difference in welding with modern type D.C. Rectifiers. Don't be satisfied with anything but top performance and a unit that is dependable for long life, service-free operation.

In Hobart, you get three delta-connected transformers, one for each phase. A magnetic line switch. Overload protection on both rectifier and transformer, plus remote control at no extra cost. You'll be amazed at the high efficiency and low operating cost that cuts power bills.

Backed by well over a half century of building the most complete line of welding equipment on the market today. Write for detailed specifications, no obligation.

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One of the world's largest builders of arc welding equipment.

300 AMP. D.C. WELDER
For production, maintenance and general shop welding. For light or heavy duty welding in 200, 300, 400, 600 amp. sizes, portable or stationary.

GASOLINE ENGINE DRIVEN
For speedy, low cost welding in the field when electric power is not available. Available in 300, 400, 600 amp. sizes.

HOBART "POWROMATIC"
Constant voltage D.C. welder for automatic and semi-automatic welding. Simplified controls. Assures uniform metal deposit and faster production.

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For shops that have only single phase power supply available. Liked by operators because it starts fast and holds a stable arc.

★ Use the Handy Coupon for complete information. No obligation, of course.

Meters and Portable Mountings are Optional Equipment

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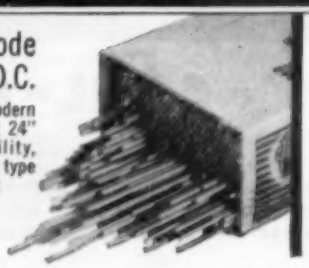
Sensational NEW electrode "Rocket 24" for A.C. or D.C.

Here's an electrode in keeping with modern welding procedures. The new "Rocket 24" gives greater speed, maneuverability, strength and smoothness. It's a contact type electrode, heavily coated, employing iron powder in the coating which becomes a part of the weld. Write for free samples.



HOBART BROTHERS CO., BOX ST-15, TROY, OHIO

Please send complete information on the items checked below:

- ☐ Hobart Rectifier Welder
- ☐ 300 amp. D.C. Welder
- ☐ Gasoline Engine Driven
- ☐ Hobart "Powromatic"
- ☐ Transformer Welder
- ☐ Electrode Samples

☐ FREE "Welder's Vest Pocket Guide"

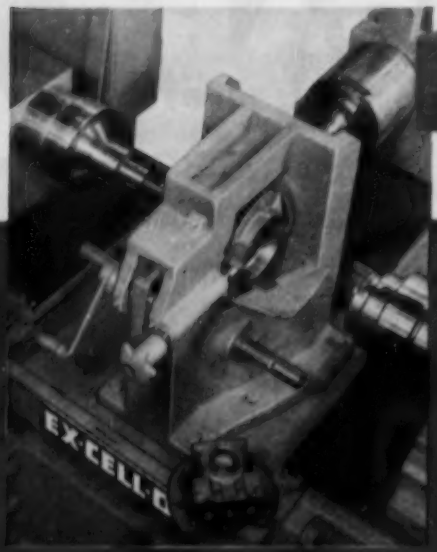
NAME _____ POSITION _____

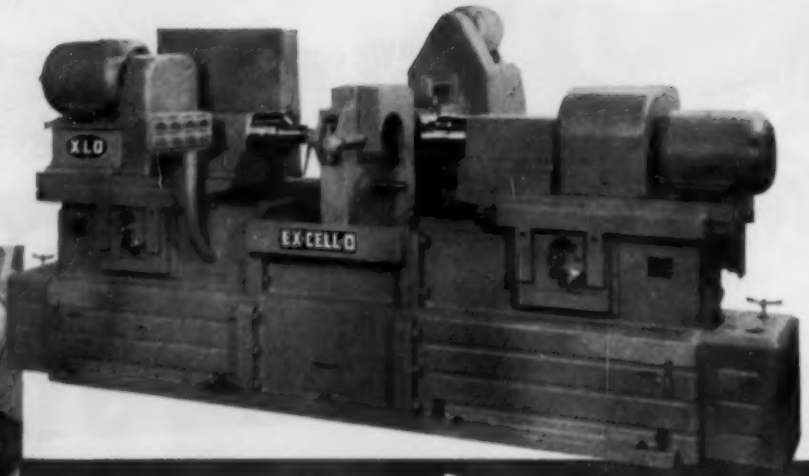
FIRM _____

ADDRESS _____

Ex-Cell-O 3-Way Precision Boring Machine. Standard way units—tooled to suit the work.

Note the simplicity of this tooling.





Cut Costs—Combine Operations

. . . INSURE YOUR PROFITS in Today's Competitive Market

Heavy lines show the machined surfaces. Small single triangles indicate single operations; double triangles indicate rough-and-finish operations.

Once a part is properly located and clamped, it's good practice to do as much machining on it as possible before it's moved! Related dimensions are held closer, handling time minimized and production increased.

This Ex-Cell-O 3-Way Precision Boring Machine performs 5 roughing and 18 finishing operations on a cast-iron crankcase used in the refrigeration industry. Tolerances are extremely close on the crankshaft and cylinder bores. Net production for the roughing operation is 33 parts per hour; for finishing, 36 parts per hour.

Ask your local Ex-Cell-O representative about all the other advantages of Ex-Cell-O Way Machines—or write today for Bulletin.

XLO
EX-CELL-O for PRECISION

EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING SPINDLES • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

34-30

This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 136 No. 2 January 10, 1955

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Save Your Time—
Save Your Tools

A Twist of the Wrist engages or releases the cutters. Double lugs on cutter engage double abutments in holder. Double aligning bearings for rigidity.

Phantom view shows the strong, rigid drive for quick interchangeability of tools.

CONTINENTAL has three STANDARD COUNTERBORE SETS for your selection. They are toolroom favorites. WRITE FOR CATALOG and prices.

CTW

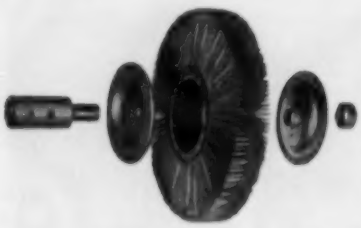
CONTINENTAL TOOL WORKS
Division of
Ex-Cell-O Corporation
Detroit 32, Michigan

for light grinding and polishing

GRIND-O-FLEX

FLEXIBLE GRINDING WHEEL

This fast-cutting grinding wheel removes burrs, flash, tool marks from contoured parts without digging into the metal. Consists of hundreds of "leaves" of aluminum-oxide cloth sealed to a core. Attaches to your present power tools or any rotating spindle. No special equipment to buy. Wide range of grits. Safe and easy to use. Mount several wheels side by side for any required width. There's nothing like it.



For finishing complex contours

SAND-O-FLEX

BRUSH-BACKED ABRASIVE WHEELS

Use Sand-O-Flex for lighter and more intricate contour work on metals, plastics, wood, rubber, etc. Cannot gouge, "flat" or mar surfaces. Attaches to motor shaft or power tools. Available in four sizes from portable to heavy-duty production line models. Refill abrasive cartridges range from coarse to very fine for all types of finishing and polishing. Write for catalog and prices.

MERIT PRODUCTS, INC.

4023 IRVING PLACE, CULVER CITY, CALIF.

behind the scenes

Good By, Pi?

Many years ago when we toiled for a self-confessed mighty man who still runs a newspaper in Chicago, a mild mannered mathematician approached us with a scoop. "I have just succeeded in trisecting an angle," he whispered, peering about with the air of a man who might have just stepped from the fourth dimension. We pointed out that his story would have had more news value if it had concerned the disection of an angel, and he went away muttering something about pearls and swine, and the futility of revealing matters of great import to people who walked about on their heels.

Great scientific developments still beat separate paths to reportorial doors. Technical Editor Allen G. Gray last week entertained a man who breezed in toting a volume that apparently weighed as much as a small Shetland pony. Letting it fall to the desk, like a slab of cement, Al's guest informed him that he had come to bury πr and its brother πr^2.

"No sense in wasting a lot of time figuring any more," he said, tapping the tome. "Any diameter circle you want, I got it here in the book, with everything figured out and lettered along with the circles. Suppose you want the circumference and area of a circle 1 13/16" in diameter—" he disappeared into his book, rustled a bit, and reappeared with a triumphant "5.6941 in circumference, and 2.5802 in area."

Gray was visibly impressed, but found himself unable to make a publication offer. To the best of his knowledge, the book is still available, and if you feel like going around in circles he will steer you toward it.

Inventor Available

Be that as it may (isn't that a silly expression? Imagine trying to translate that into Japanese or Kurdish!) be that, then, as it may, we always feel abashed in the presence of inventors. Our brains equal theirs by avoirdupois standards, but it's maddening to see how much more they can do with *their* mental equipment. Consider, for example, Phillip Graham, a structural steel draftsman from Pittsburgh. Phil cooked up an idea for a Vehicle Parking Device and had it patented. He sent a copy of an artist's sketch and the patent papers to Managing Editor Walt Campbell with a suggestion that fabricators who are looking for new products need look no further, because here was a product which, if properly developed, could conceivably consume more metal than is annually produced. The device is a seesaw, teeter-totter gimmick, and Phil reports that parking lot operators look favorably on the idea. If you have a lot of loose capital, and want to get in on something as revolutionary as the steam cars, ask Campbell for Phil's address.

Still Harping On David

We had no idea that King David could stir up so much trouble. Last week we reported that some of our Sunday-School-skipping editors got into a hassle over David's paternity; the candidtates they trotted out ranged from Abraham to Moses. Even the usually well informed gentlemen who set this type got into the argument—everyone, that is, except the foreman.

"That's easy," he exclaimed. "I am David's father."

The linotype operators scowled, then grinned. The foreman's name is Jesse, and it so happens that he was named after David's father.

Editorial Prophet

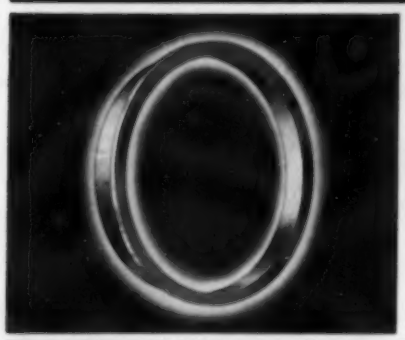
We're still dipping breathlessly into that brawny 1955 Metalworking Yearbook. We have been reading the ads, and marveling at an industry with so great a variety of services and products, and trying to guess the business trend. Associate Editor Frank Briggs, who works closely with metalworking figures, told us that he had his own system. From his office window he can see the C. &. P. Ore Dock, and the piles of ore stored there. "I just measure the ridges against the girders supporting the Huletts," he explained. "During the war you could hardly see anything but ore mountains. Now the ore crest is down to the third cross beam."

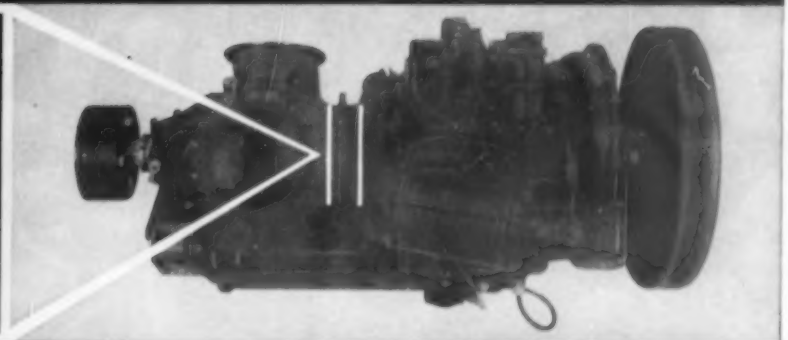
Shrdlu

(Metalworking Outlook—Page 19)

BOEING chose LEBANON

...to make the STAINLESS STEEL CASTING for the powerplant of a JET TRUCK





The Lebanon Circle (L) Casting in the Boeing 502 Gas Turbine is a product of the Centri-Die process. The complete story of this and other Lebanon Centrifugal Castings is told in a 12-page brochure. Copies are available by writing to William H. Worrilow, Jr., General Sales Manager, Lebanon Steel Foundry, 156 Lehman Street, Lebanon, Pa.

ON the highways of the Far West a 25-ton trailer truck has been powered more than 60,000 miles by a midget engine weighing only 240 pounds!

Midget in size but mighty in power, this revolutionary new power plant is the BOEING 502 Gas Turbine, developed by Boeing Airplane Company as a test model that has wide significance for the entire field of vehicular propulsion.

At the heart of the Boeing 502 is heat—searing, power-packed heat of over 1500°. Surrounding, containing and resisting this inferno is a stainless steel casting especially selected for the job—a LEBANON Circle (L) Casting, made at Lebanon Steel Foundry by people who, with Boeing, are looking toward the future.

CIRCLE L ®

LEBANON STEEL FOUNDRY

LEBANON, PENNA.

Carbon, Low Alloy and Stainless Steel Castings

Yes... Electrolizing is a COAST

Yes, from the Brooklyn Bridge to the Golden Gate, your only source for time-saving, money-saving Morse *Electrolized* Drills, Taps, Reamers, Cutters and End Mills is your nearest Morse-Franchised Distributor.

Certified test-reports prove that . . . on jobs where there's excessive wear and abrasion . . . *Morse Electrolized Tools last 2 to 10 times longer than untreated tools.*

And that's why, on any tough job you have now . . . or on *any* job, tough or not, where you can profit by this extra tool life and performance . . . it pays to consult your Morse-Franchised Distributor on the application of Morse *Electrolized* Tools to your own particular needs. He has the practical knowledge . . . and he's backed by the top line and the top engineering service of the cutting tool industry.

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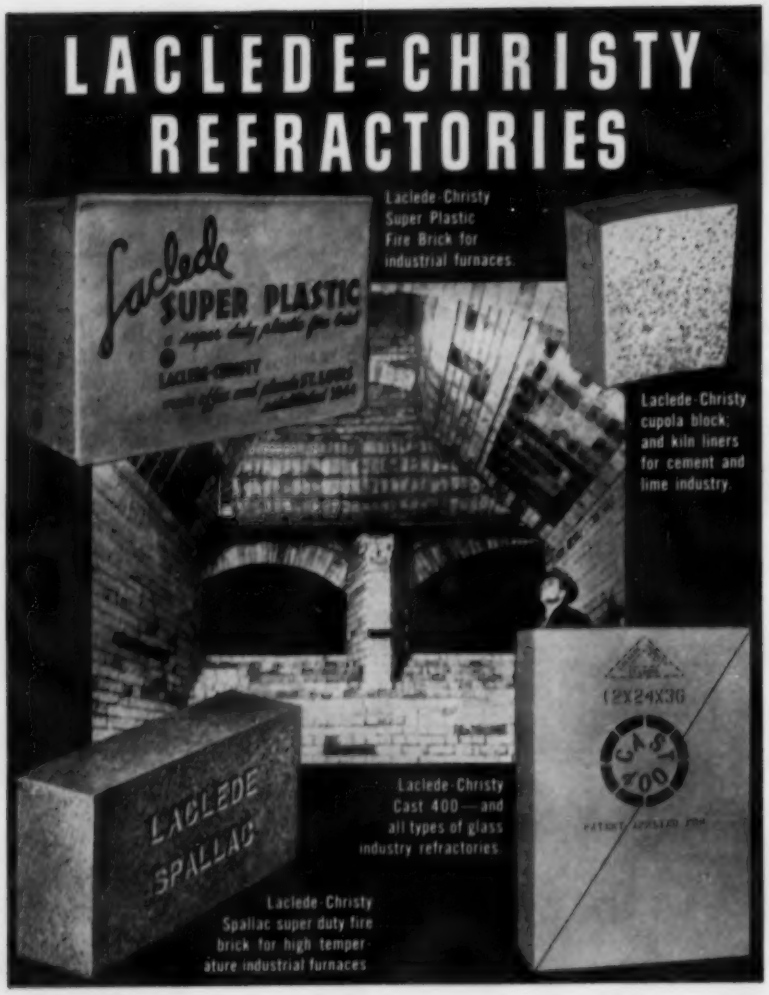
Morse Exclusive
TO COAST
MORSE
Cutting Tools
Buy them by phone from your
Morse-Franchised Distributor
and save ordering time

LACLEDE-CHRISTY REFRACTORIES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Laclede-Christy Super Plastic Fire Brick for industrial furnaces.
Laclede-Christy cupola block and kiln liners for cement and lime industry.
LACLEDE SPALLAC
Laclede-Christy Cast 400—and all types of glass industry refractories.
CAST 400
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Name your refractory needs

What do you want? Not just the correct refractory for your purpose, but fire brick, blocks or liners that deliver *more* than you expect. You want benefits that go with this kind of service—minimum furnace down time, long furnace life and economical output. You also may want engineering service and follow-through for on-schedule performance.

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Laclede-Christy refractories—for the purpose you name—meet your most rigid requirements. "Quality first" is supsupported by many, many record performances. Laclede-Christy service is quick and helpful. The extra engineering help you may need is here too—at

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Mission 7-2400

LACLEDE-CHRISTY COMPANY Quality First

Inaugurating a new era of service to the industrial heating industry

LETTERS
TO THE EDITORS

New Horizons Open

Will you please send me three copies of the article, "Copper Sidesteps the Crucible," by John D. Shaw, president of S-K-C Research Associates, Paterson, N. J. (when metal powder is cheaper than cast metal, new horizons open . . .)? The article appeared on p. 76 of the Dec. 20 issue.

P. Ulf Gummeson
plant manager
Hoeganaes Sponge Iron Corp.
New York

• *Being Sent.—ED.*

Roundup on Galvanizing

We would like to receive 10 copies of each of the following articles on galvanizing:

"Modern Practice of Hot Dip Galvanizing" (Feb. 22, Mar. 1 and Mar. 8)

"Continuous Galvanizing Line" (Apr. 5 and Apr. 12)

"How To Avoid Galvanizing Embrittlement" (Nov. 22)

"Galvanizing Line in a Hurry" (Nov. 29)

Ray L. Farabee Jr.
Production Department
Delta Tank Mfg. Co. Inc.
Baton Rouge, La.

We would like tear sheets of the following articles: "Modern Practice for Hot Dip Galvanizing," "Continuous Galvanizing Line," and "How To Avoid Galvanizing Embrittlement."

Walter Webb
Ralph V. Ruion Inc.
Philadelphia

Please send us a tear sheet of each of those articles . . .

F. S. Daum
American Steel Supply Corp.
Ft. Wayne, Ind.

Please send us tear sheets of the Apr. 5 and Apr. 12 articles on the "Continuous Galvanizing Line" . . .

F. N. Wilson
Galvanizing Department
Dominion Foundries & Steel Ltd.
Hamilton, Ont.

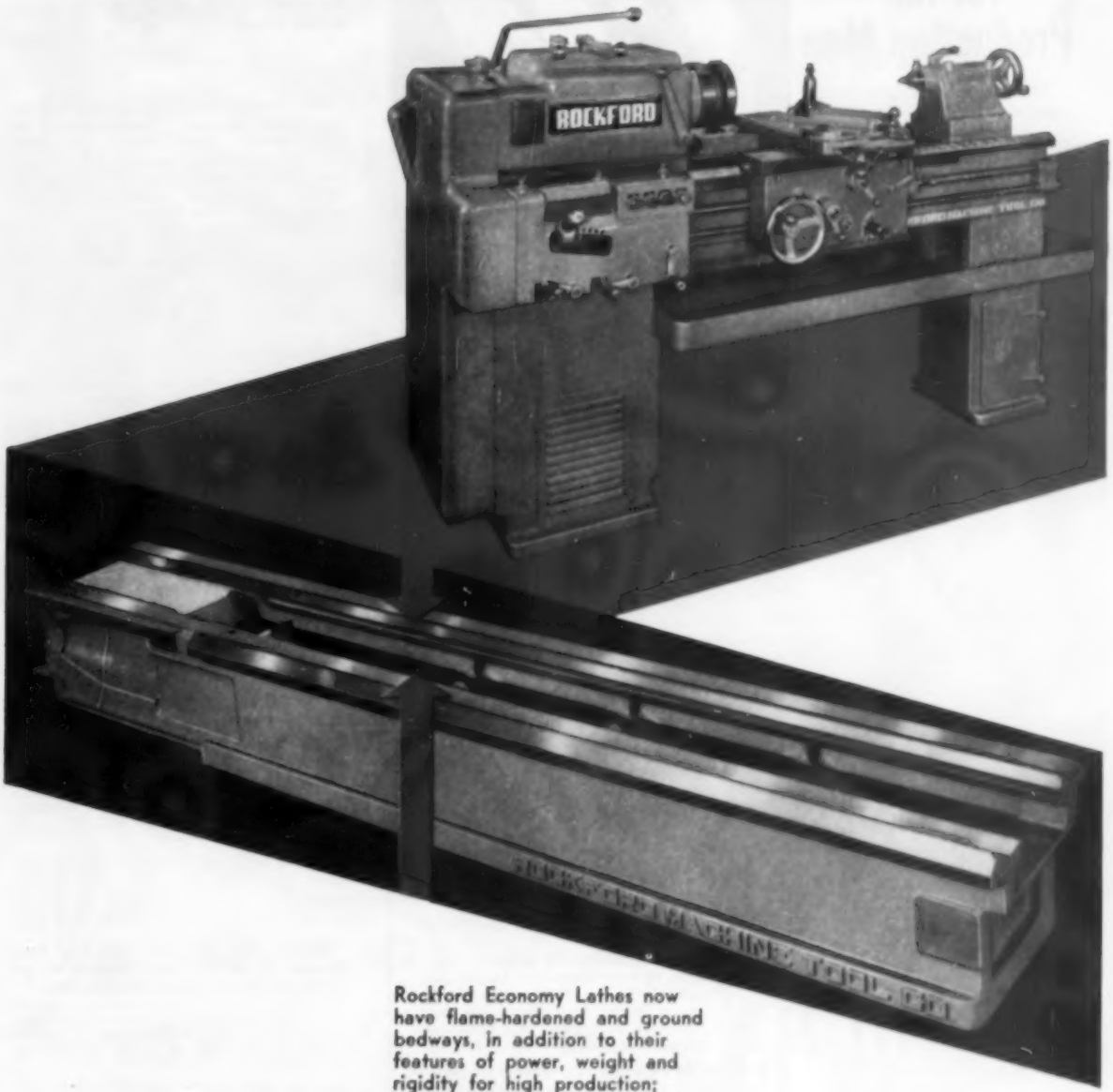
Accent on Transportation

In the Aug. 23 issue there was a fine article, "Transportation in Distribution," No. 7 in STEEL's 1954 Program for Management series (move Ahead with Better Traffic Management . . .).

(Please turn to page 12)

ROCKFORD ECONOMY LATHES

now have ground, FLAME-HARDENED BEDWAYS



Rockford Economy Lathes now have flame-hardened and ground bedways, in addition to their features of power, weight and rigidity for high production; accuracy requirements for tool room work; and speeds for carbide tools.
Our new catalog No. 903 contains complete data and specifications. Ask a Rockford Machine Tool Co. representative for a copy, or write direct to

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MEDIUM-SIZED
ECONOMY-PRICED

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Practical Idea for the Production Man

Efficient electric hoists...to move materials overhead and release floor space for more valuable operations.

CM HOISTS

CM COMET ELECTRIC CHAIN HOIST
½ to 2 ton capacities—Pendant rope or push button control. Lifetime lubrication. Herc-Alloy double duty load chain. Sensitive control for spotting loads. Heavy duty brake. Upper-lower limit switches.

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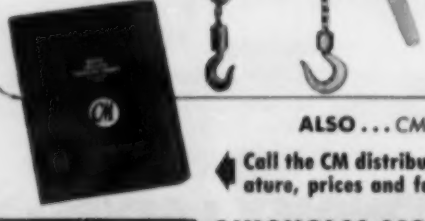
½ to 5 ton capacities—Compact, enclosed design. Low headroom. Continuous duty motor with thermal overload protection for heavy duty service. Precision bearings and helical gears for long life. Only 110 volts at push button control.

Good Suggestion for the Maintenance Man!



Rugged lightweight hand hoists and pullers...to make your job easier and safer

CM CYCLONE HAND HOIST
½ to 10 ton capacities—Easy to carry and lift. One ton model weighs only 36 pounds. Made of tough aluminum alloy. Herc-Alloy load chain. High efficiency. Lifetime lubrication.

CM PULLER THE "ONE MAN GANG"
¾ to 6 ton capacities—Lifts or pulls at any angle. Lever handle operation. Automatic load brake holds at any point. ¾ ton model weighs only 13 pounds. Herc-Alloy flexible load chain.

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In Canada: McKINNON COLUMBUS CHAIN LIMITED, ST. CATHARINES, ONTARIO

LETTERS

(Concluded from page 10)

We would like to obtain several copies of that article.

W. J. Kearins
traffic manager
P. B. Mutrie Motor Transport Inc.
Waltham, Mass.

We recently had the opportunity to read your article, "Transportation in Distribution." That article was brief and yet complete regarding the functions of the traffic department in the various phases of transportation and distribution. Will you please send us six copies of that article . . .

B. B. Caruso
assistant to the director of transportation and traffic
Allegheny Ludlum Steel Corp.
Pittsburgh

• *Sent.—ED.*

Call for Guides

We recently had the opportunity to use your "Guide for Tool Steels and Carbides." Since we have found it extremely useful, we would appreciate your making arrangements to send us a copy.

Terry J. Merritt
manager
Metalmaster Division
Clinton Machine Co.
Clinton, Mich.

Please send us four copies . . .

J. B. Smith
plant purchasing agent
Valve Division
Eaton Mfg. Co.
Battle Creek, Mich.

Please send me a copy . . .

E. Richards
plant manager
Security Sash & Screen Co.
Detroit

We would appreciate your sending us six copies of "Guide for Steel Buyers."

O. B. Schmeltz
president
Rees Machinery Co. Inc.
Pittsburgh

Please send us a copy as soon as possible . . .

J. A. Guidera
Charles A. Koons & Co.
New York

Please send me the "Machine Tool Buyers' Guide." I am anxious to get a copy of this as soon as possible.

Herbert Graebner
Executive Division
James Vocational Bureau
Detroit

• *Sent.—ED.*

For Your Information

We are interested in your article, "When Metal Weds Plastic . . . A New Material Is Born," in the Dec. 6 issue, p. 116.

The bond strength of about 30 pounds per square inch, however, seemed rather low when compared to the bond obtained in bonding rubber to metal. We have been able to obtain bond strengths above 200 pounds per square inch with our amorphous zinc phosphate coatings on motor mountings, and would like to call this fact to the attention of the Naugatuck Chemical Division, U. S. Rubber Co., mentioned in your story.

J. A. Hendricks
director of research
International Rustproof Corp.
Cleveland

• *Your letter is being forwarded to Naugatuck Chemical.—ED.*

Where Severe Duty IS NORMAL DUTY

HANDLES REPEATED OVERLOADS WITH EASE

Extra overload capacity . . . extra durability and reliability have been built into this heavy duty contactor — to make your roughest dc drive a smooth running, precision operation . . . to assure maximum production and quality with a minimum of outage time and maintenance. Principal component on the Allis-Chalmers constant potential panel, the Type 260 dc contactor is a rugged unit engineered to withstand punishing current surges inherent in steel mill auxiliary drive operation.

Here's Why!

● **Quick quenching minimizes contact burning** — Arc centering blowout uses thermal convection and magnetic action to stretch, cool and extinguish arc. Rapid circuit interruption minimizes burning and pitting of contacts.

● **All current-carrying parts silver to silver** — Main contacts are high density forged copper, plated with silver for dependability and extended life. Auxiliary contacts are solid silver . . . need no dressing.

● **Magnet coil designed for continuous duty at 110% of rating** — Coil layer wound with insulation between layers . . . vacuum impregnated to resist moisture and abuse. Operates contactor at less than 80% of rated voltage when hot. Holds at 20% of normal voltage.

● **Other features.** Rolling contact action. Arc handled on tips, current on clean heels . . . no destructive scuffing. Design simplicity eliminates troublesome linkages, arms and pivots. Lifetime *Oilite* shaft bearings need no lubrication. A-4336

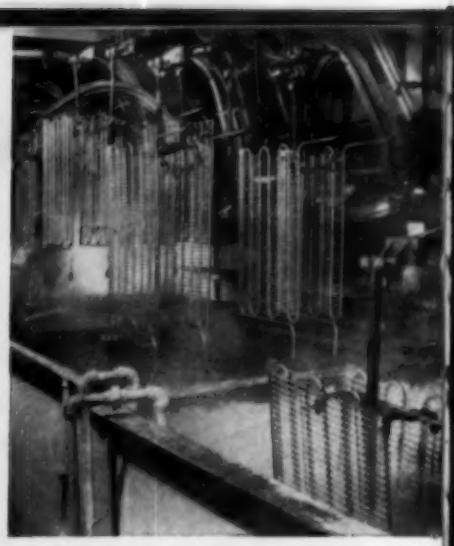
SIMPLIFIED ROUTINE INSPECTION

Keeping the Type 260 contactor in top operating condition is merely a matter of preventive maintenance through routine inspection. All components are readily accessible. Arc chute lifts off to expose contacts which may be removed by loosening one bolt. Auxiliary contacts are mounted on contactor frame in full view. Operating coil is held by a single bolt.

For complete information, call your nearby Allis-Chalmers representative or write Allis-Chalmers, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

1. The Shopping Carrier you use at supermarket or grocery, made of welded steel wire, may have come from United Steel and Wire Company where a variety of models are produced at a 500-a-day clip. Finish must be extra smooth to prevent torn packages.



2. Home Freezer Shelves are given a bright chrome finish on this automatic plating line. Steel wire must be clean and smooth as plating will magnify the slightest surface imperfections.

Steel

Truly, the uses for steel wire seem inexhaustible, and Pittsburgh Steel Company makes wire for nearly all of them.

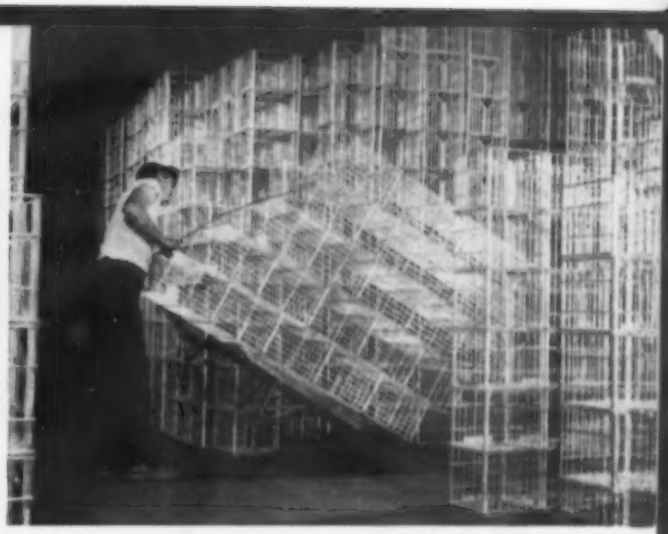
Yet today a whole new field of uses has emerged, one that is expanding so fast there has been little effort to tabulate its growth. This is the market for formed wire products. The uses of steel wire have taken on a whole new dimension as more and more formed wire products are designed and built for everything from grocery carriers to bird cages.

• Creative Minds At Work— Formed wire products are not entirely new. Perhaps they began with the first coat hangers, bustles, or wire-backed chairs. But since World War II, the myriad uses produced by creative designers have opened broad new horizons. Today you find steel wire going into such diverse products as utility containers, modern furniture, letter holders, wall decorations, and outdoor grilles.

To quickly grasp the size of this new dimension, take a look at one of the nation's leading producers of formed wire products—United Steel and Wire Company of Battle Creek, Michigan. Since the end of World War II, it has

(Advertisement)

3. Ice Cream will be frozen in these hardening cases. Once welded, the wire is galvanized to protect against corrosion. United holds forms and jigs for 400 special sizes.



4. Your Milkman may deliver your milk on one of these wire bottle crates made by United at a rate of 3,000 daily. Sturdily built, yet light in weight, they have self-cleaning features.

Wire Takes On A New Look

nearly doubled the size and scope of its operations.

In one year United produces some 4,500,000 shelves for several well-known makes of home refrigerators; 875,000 shelves for commercial refrigerators; 900,000 milk crates and ice cream hardening cases; 750,000 baskets of various types; 100,000 grocery carriers; and additional hundreds of thousands of point-of-sale display stands; outdoor grilles; beverage cases; dish racks; and bird cages. To make these products, United uses about 15,000 tons of wire annually—an important share of it from Pittsburgh Steel Company.

Structural advantages of formed wire products include strength and rigidity with light weight. Wire construction provides for self cleaning and permits air or liquid circulation.

• **Importance Of Quality**—Steel wire that goes into these products ranges in sizes from nearly one-half inch to less than one-tenth of an inch in diameter. It has to be strong, yet ductile enough for easy welding on intricate automatic multiple welding machines. It has to have an extra smooth and clean surface to permit chrome and nickel plating, galvanizing or painting, and produce an attractive yet durable finish.

To produce this wire, United relies on wire makers with long know-how. Pittsburgh Steel Company, one of United's important suppliers, has had more than 50 years' experience in wire making. Its range includes everything from large diameter basic bright wire to intricate specialty wires as fine as a human hair.

Pittsburgh Steel has long produced quality spring wire including low, medium and high carbon, and alloy; M. B. hard drawn; and oil tempered. It has a good reputation for production of quality ACSR core wire for cable, welding wire, rope wire, cold-heading wire, flat and shaped wire, rivet wire, screw wire, and nails. Its fabricated products include a full range of farm and lawn fence, chain link fence, and welded wire fabric for construction.

This combination of know-how and modern facilities enables Pittsburgh Steel to supply the kind of wire United needs for its broad line of formed wire products.

If you are making formed wire products, why not look into the opportunities with Pittsburgh Steel's basic bright wire and plating quality wire? Chances are good it will be worth your while to call the nearest district sales office to have a salesman call to discuss your problems and offer suggestions, or to give you information on prices and delivery. You'll find him ready to serve you right now!

"Everything New But The Name"

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

DISTRICT SALES OFFICES: Atlanta • Chicago • Cleveland • Columbus • Dallas Dayton • Detroit • Houston • Los Angeles • New York • Philadelphia • Pittsburgh San Francisco • Tulsa • Warren, Ohio. **PLANTS:** Monessen, Pa. • Allenport, Pa. Akron • Los Angeles • Unionville, Conn. • Warren, Ohio • Worcester, Mass.

Write for your copy of the color brochure "The New Pittsburgh Steel Company."

(Advertisement)

STAR QUALITY
Costs No More

why not get these
SAFE, UNBREAKABLE
high speed blades
from your STAR Distributor?

For over 75 years, industry has *known* STAR Hand and Power Hacksaw Blades as *quality* blades.

Here, as an example, is the STAR Unbreakable High Speed Steel Blade—safe, fast-cutting, long-lived. The STAR combination of a flexible steel back, special-process weld and high speed steel cutting edge adds up to an efficient, shatterproof, proved-quality blade.

STAR SERVICE COSTS NO MORE

Order any of the complete line of STAR Blades from your Industrial Distributor—your best source of supply for hundreds of the items you need to operate efficiently, economically, and without production interruptions.

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CLEMSON BROS., Inc.
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Makers of Hand and Power Hack Saw Blades, Frames, Metal Cutting Band Saws and Clemson Hand and Power Lawn Machines.

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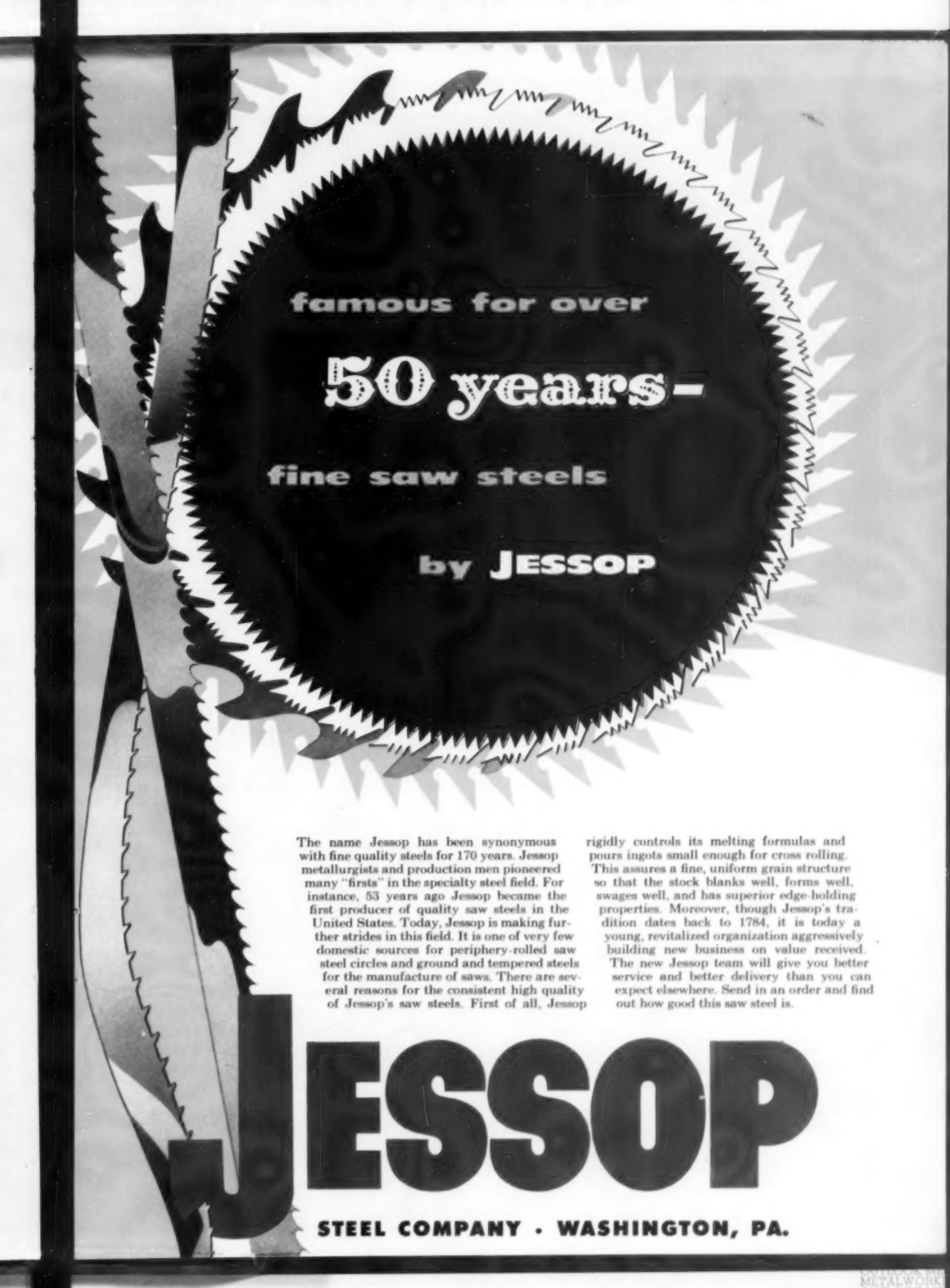


The name Jessop has been synonymous with fine quality steels for 170 years. Jessop metallurgists and production men pioneered many "firsts" in the specialty steel field. For instance, 53 years ago Jessop became the first producer of quality saw steels in the United States. Today, Jessop is making further strides in this field. It is one of very few domestic sources for periphery-rolled saw steel circles and ground and tempered steels for the manufacture of saws. There are several reasons for the consistent high quality of Jessop's saw steels. First of all, Jessop rigidly controls its melting formulas and pours ingots small enough for cross rolling. This assures a fine, uniform grain structure so that the stock blanks well, forms well, swages well, and has superior edge-holding properties. Moreover, though Jessop's tradition dates back to 1784, it is today a young, revitalized organization aggressively building new business on value received. The new Jessop team will give you better service and better delivery than you can expect elsewhere. Send in an order and find out how good this saw steel is.

JESSOP

STEEL COMPANY · WASHINGTON, PA.

One Phase of the search for answers to high-temperature questions is the continuing development and testing of new alloys. Here Inco metallurgists pour a carefully controlled composition of metals from their laboratory radio-frequency induction furnace. The resulting alloy may help to solve some of the unanswered high-temperature problems facing engineers today.

What causes high-temperature failure?

Strange reactions can take place when metals and alloys are exposed to high heat.

Even common soot and the air itself become destructive corrosives that can disintegrate a metal and waste away its strength. The more these reactions are studied the more evident it becomes that the damage caused by high temperature corrosion is one of the most serious reasons for metal failures.

Unless a metal or alloy can resist destruction by its corrosive environment under operating conditions, it makes little difference how high or low its mechanical properties may be.

No single metal or alloy can resist all these corrosive conditions. For 20 years Inco metallurgists have been experimenting with carefully controlled compositions of metals . . . searching for the answers to the problems posed by expanding temperature frontiers. From this work have come such strong, heat-resisting alloys as Inconel® and Inconel "X"®, Incoloy® and the Nimonic® Alloys.

Yet with the gas turbine seemingly held in check by the temperature limits of metals, with the chemical and petroleum industries moving from "red-hot" to "white-hot" process temperatures, and with the development of the rocket engine and nuclear power pushing ahead, you may be asking yourself, "Have metals reached their limit of practical service at today's operating temperatures?"

Inco metallurgists think not. Who knows what future research programs may reveal?

If you have a problem involving high temperatures, the solution may already be in the files of Inco's High Temperature Engineering Service. If not, our engineers will be glad to work with you to find it. The first step is to write for a High Temperature Work Sheet, our form that helps you outline your problem for study. After that it is up to us. There is no obligation on your part.

INCO TRADE MARK

NICKEL ALLOYS PERFORM BETTER LONGER

THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street New York 5, N. Y.

STEEL COMPANY · WASHINGTON, PA.

Pension Planning

Some 70 per cent of corporations plan no changes in their pension plans. Johnson & Higgins, insurance brokers, are alarmed at that figure because the 1954 social security amendments make numerous changes that could have a big effect on your program. An estimated 11.5 million workers are covered by health, insurance and pension plans under collective bargaining, compared to about 7.7 million in mid-1950. Despite the increased coverage of private and public plans, 34 of every 100 persons over 65 are still working, 17 are living on private assistance, 18 are living on income from public or private pensions, 22 are living on public assistance, 9 are living on life insurance or other investments.

Two-way Stretch

The new housing boom means more business to metalworking from two directions: More houses, bigger houses. Between 1.1 million and 1.2 million nonfarm dwelling units will be started this year, and on the average they'll be bigger. A Department of Labor Survey indicates that the 1954 average house was some 5 per cent larger than a home built in 1951. The typical 1954 unit contained 1140 sq ft of floor area.

More Truck-trailers in '55

Look for truck-trailer manufacturers to build some 60,000 units in 1955, compared to 55,000 in 1954. The industry, according to the Truck-Trailer Manufacturers Association, will also continue its trend away from government business. Last year, only 10,000 trailers went for military, other government and export purposes, contrasted with 46,000 such vehicles in 1953. Although production and shipments for 1954 were off 45 per cent from 1953, dollar volume dropped only 19 per cent.

Happier New Year for Shipbuilders

It's a little happier new year for shipbuilders. They are encouraged by a deal between the Federal Maritime Board and the American President Lines, whereby APL agrees to buy or construct 19 ships over the next decade.

Third Round for Conveyor Belt

In progress is the third round in the battle for a 100-mile ore-coal conveyor belt from Lake Erie to the Ohio river. Riverlake Belt Conveyor Lines Inc., Akron, first asked the Ohio legislature in 1949 for the right of eminent domain. The proposal died, as it did again in 1951. Now Riverlake is trying once more to convince the legislators who convened last week. But this

time, chances look better for approval because of a careful public relations build-up with rural voters where much of the opposition lies. On the industrial front, railroads are against the proposal, but strong proponents are potential users, steel companies, utilities and potential suppliers such as rubber firms, conveying equipment manufacturers and motor makers.

Big Business in Oil, Gas

Watch for heavy drilling and high capital expenditures to keep the oil and gas industry one of metalworking's major markets in 1955. A record 53,000 new wells were drilled in 1954, up 8 per cent from 1953. And they were deeper, requiring 216 million feet of hole, up 9 per cent from 1953. Wells will continue to get deeper, and the need for oil will rise. The Bureau of Mines forecasts total new supplies of 3056 million barrels of the fuel in 1955, compared to 2949 million in 1954. Gas utilities alone expect to spend $1 billion on construction and expansion this year.

The Plastic Potential

Some 5000 to 6000 potential customers. That's a possible market for manufacturers of machinery to make plastics or plastic products. The Society of the Plastics Industry says: "The year 1954 was good as the industry sought to modernize its plants and reduce costs. Indications are that this will continue into 1955." Synthetic resin production in 1954 was an estimated 1,357,000 tons and should rise to 1,424,500 tons in the next 12 months.

Straws in the Wind

In its fiscal year that ended last Sept. 30, the CIO had a $200,000 deficit despite a 37,500 increase in its membership . . . Chrysler Corp.'s Airtemp Division has cut prices of room air conditioners from $30 to $100 . . . Chrysler's Chrysler Division will erect a $20-million building to expand capacity 40 per cent . . . Northeastern Steel Corp. plans to offer securities to help finance expansion of the former hot-rolled strip mill of Stanley Works at Bridgeport, Conn. . . . New chairman of the Renegotiation Board is Frank L. Roberts, a member since its creation by the 81st Congress.

This Week in Metalworking

Buying of industrial components is increasing (p. 27) . . . Materials handling equipment manufacture: An industry with growing pains (p. 28) . . . Used machinery dealers will step up their fight in the new Congress for tax relief that was granted last year on new equipment (p. 29) . . . The LP-Gas industry continues its phenomenal growth (p. 30) . . . Staples stitch together an expanding business (p. 32) . . . The U.S. is considering financial aid to companies that will build titanium production facilities (p. 33).

These 25 parts of Armco ALUMINIZED STEEL are used by one company in eight different appliances. They are electric toasters, irons, corn poppers, coffee makers, waffle irons, sandwich grills, deep-fat fryers and percolators. Parts include element pans, bottoms, baffles, handle and terminal brackets, crumb tray, shield and base plate.

Special Armco Steel CUTS COSTS OF 25 PARTS FOR MANUFACTURER

Here's what the manufacturer of electrical appliances gained by changing interior parts of eight products from plated metal to Armco ALUMINIZED STEEL:

LOWER COSTS

Elimination of plating ended handling, cleaning and racking costs as well as actual plating costs. This produced savings of as much as 10 cents a part.

BETTER PRODUCTS TOO

Efficiency of all appliances was improved noticeably. The high *heat-reflectivity* of Armco ALUMINIZED STEEL keeps heat inside where it belongs. This makes appliances easier on kilowatts, means lower table-top temperatures.

IMPROVED APPEARANCE

Many of these internal parts are partly visible. When made of plated steel they showed ugly discoloration from high temperatures. The Armco ALUMINIZED STEEL parts show no discoloration because of their fine *heat resistance*.

SEE FOR YOURSELF

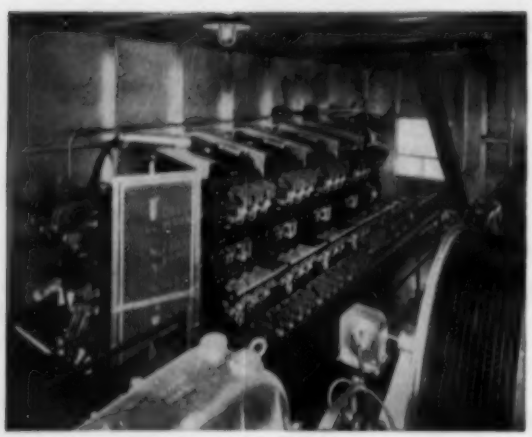
If you make products or parts that require a combination of heat- and corrosion-resistance or heat reflectivity, investigate this hot-dip aluminum coated steel. It is made in sheets and coils 13-through 28-gage and in widths up to 48 inches depending on gage. For further information write us for the booklet, "Armco ALUMINIZED STEEL."

ARMCO STEEL CORPORATION
785 CURTIS STREET, MIDDLETOWN, OHIO

ARMCO

SHEFFIELD STEEL • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

KING SIZE Barge-Crane shown with 62½-Long Ton Test Load on 50-Long Ton Floating Crane. Built by Wiley Mfg. Co., Port Deposit, Md.



View above shows EC&M Crane Protective Panel at left, row of EC&M Magnetic Controllers with the well-known LINE-ARC Contactors and TIME-CURRENT Relays, and EC&M Cam Master Switches (arranged for remote operation) at the extreme right. Adjacent to the hoist drum in the foreground is an EC&M Rotating Cam Limit Switch and beyond this an EC&M Type WB Brake partially shows.

Wiley Manufacturing Company takes advantage of the inherent safety and quick response in operation of series-wound brakes and the simplicity and excellent characteristics of series motors for the main, auxiliary and whip-hoists and luffing motion of their barge-cranes.

The EC&M Wright Dynamic Lowering Circuit Controller used on these motions prevents heavy peak loads on the Diesel Generator, because:

(1) ALL line current passes through the brake coil on the first point lowering, giving quick brake release with minimum power.

(2) EC&M TIME CURRENT Relays retard the rate of acceleration of heavy loads in hoisting, yet allow faster operation with light loads. And for rotating the crane, TIME-CURRENT Relays govern the rate of acceleration of the swing motion with topmost smoothness.

Specify EC&M Control to get these exclusive advantages.

1761

THE ELECTRIC CONTROLLER & MFG. CO.

2698 East 79th Street ★ Cleveland 4, Ohio

It's Your Government

With control of the executive and legislative branches of the federal government split between the Republicans and the Democrats for the next two years, you will need to keep a closer watch over what happens in Washington. There will be many developments profoundly affecting you and your business.

It is evident from President Eisenhower's State of the Union message to Congress that the Republicans are taking no chances on a recession; the reimposed curbs on the stock market make it equally evident that the administration does not want rampant inflation.

Without too much argument, the President's program could be labeled a continuation of the one developed by the Democrats over two decades. Witness: Higher incomes for government workers; an increase in the minimum wage from 75 to 90 cents; more public housing and health insurance.

A whopping big highway program could mean direct and indirect spending of $40 billion a year—alone a good pickup for any sag in the economy.

Defense spending now is on the beam for the kind of weapons needed to win a nuclear-electronic war. This spending will rise for several months, then level off on a high plateau.

In extension of the Reciprocal Trade Agreements Act, the President wants the power to reduce tariffs as much as 15 per cent. He thinks the best way to get more prosperity abroad is to let other countries sell us more goods. The proposal will get rough treatment from Republicans in Congress and from labor—but it could pass.

The administration wants to get closer to a balanced budget, yet maintain high-level spending. So, don't count on corporate or excise tax relief. But, as a fine vote-getter, the Democrats will try for larger personal tax exemptions.

Any move to revise the Taft-Hartley labor law will draw the combined resistance of old-line Republicans and the southern Democrats.

As the two parties look ahead to the next elections, there will be plenty of maneuvering. Many of the real issues will be clouded by political expediency. There may be legislation harmful to business.

Over the coming months, it will pay to keep a watchful eye on Washington. Don't hesitate to express your views in government where they count—to senators, representatives and higher-ups in administrative departments. Remember, it's your government!

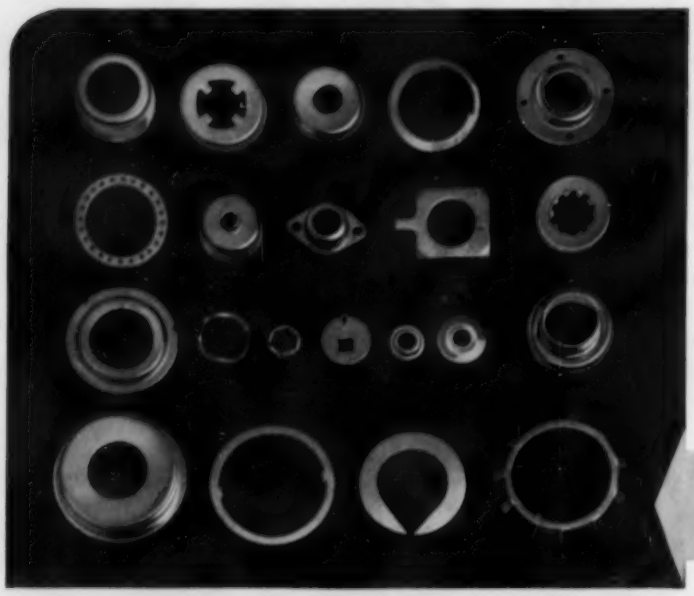
Irwin H. Such

EDITOR

A Source You Can Rely on...
A Name to Remember

Experience is a valuable asset in the development, manufacture and distribution of any product. In this respect we offer you the cumulative benefits of *Continuous Service to Industry Since 1887* . . . including origination and pioneering of mass-production equipment for the economical manufacture of washers.

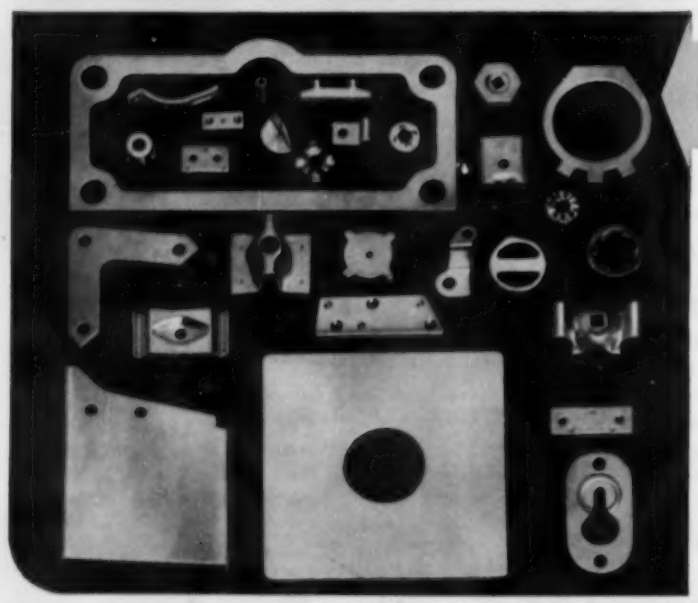
SINCE 1887



WASHERS

No matter what your washer requirements may be . . . whether for U. S. Standard Washers, SAE Washers, Rivet Washers, Lock Washers, Light Steel Washers, Finishing Washers, Machine Bushing Washers or Special Washers of any size, any desired material or finish . . . "MILWAUKEE WROT WASHERS" is the name to remember! Here, in the world's largest plant devoted to this specialized type of production, we have available more than 25,000 sets of dies — a priceless asset in providing the most complete and comprehensive selectivity to meet your needs.

Write for Catalog "30".



STAMPINGS

If it can be punched out of metal—if die-making ingenuity and tool-making facilities can provide the means for producing stampings to meet your production specifications; if the job can be handled most advantageously as a stamping—again, "MILWAUKEE WROT" is the name to remember. Here is a soundly established source of supply you can rely on — plus *Quality Standards* that are a source of pride to us, as manufacturers, and a source of satisfaction to our most discriminating customers. We'd like to serve you.

Let us quote on your requirements . . . covering fabrication in any material and in any finish. Furnished machined, heat-treated or surface-ground, as may be specified.

WROUGHT WASHER MFG. CO.

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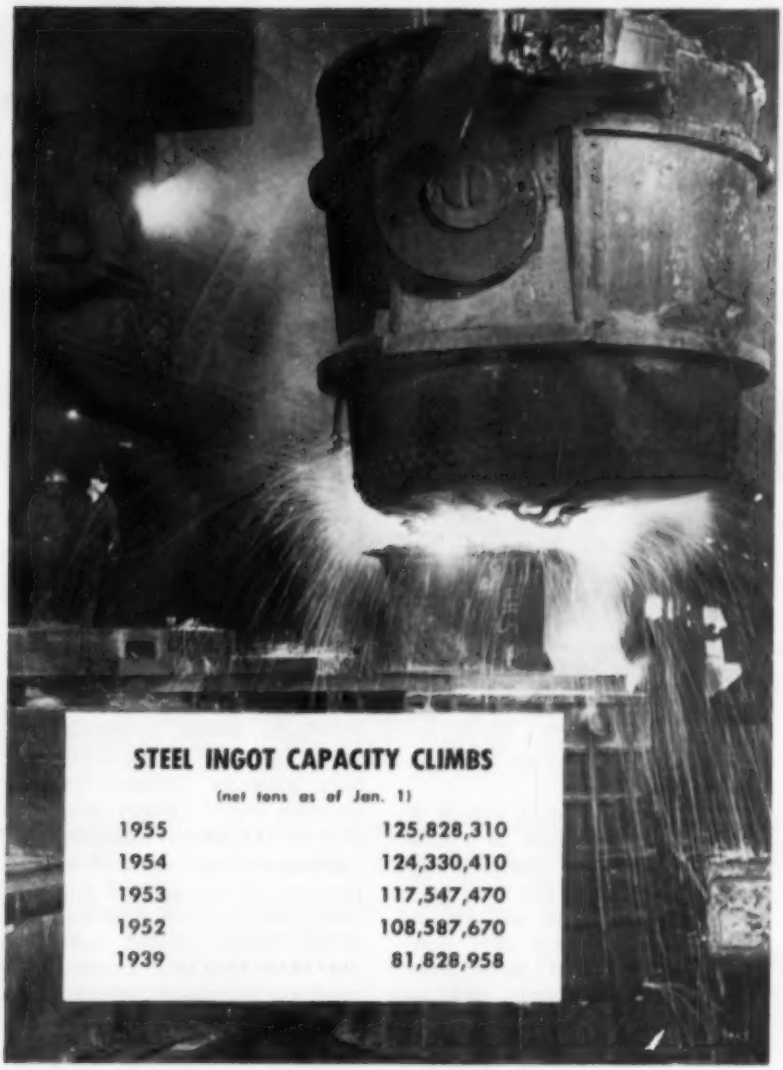


STEEL INGOT CAPACITY CLIMBS

(net tons as of Jan. 1)

1955	125,828,310
1954	124,330,410
1953	117,547,470
1952	108,587,670
1939	81,828,958

For the world's largest steel industry . . .

New Peak in U.S. Ingot Capacity

THE NATION's steel industry boosted its ingot capacity 1.5 million tons in 1954, despite an indifferent year when operations averaged about 71 per cent of capacity.

We start 1955 with an annual steelmaking capacity of 125,828,310 net tons of ingots and steel for castings, according to American Iron & Steel Institute.

Up and Up—The new annual capacity figure is an increase of nearly 34 million tons (or about 37 per cent) in the nine postwar years. It's a 54 per cent increase since 1939 (see table).

The industry's blast furnace capacity went up 1,969,710 tons last year. As of Jan. 1, 1955, it's rated at 83,971,100 net tons annually. Coke capacity is rated at 72,684,750 net tons a year.

The new weekly steel capacity figure, on which the weekly operating rate will be based starting Jan. 3 (see p. 93), is 2,413,278 net tons of ingots and steel for castings, compared with 2,384,549 tons at the start of 1954.

Some Steel To Be Marked

By April this year, many steel mill products will be carrying specifications markings.

At the request of an American Iron & Steel Institute task force, the armed services have drawn up a list of "critical steel products" on which a start is to be made. It includes high-alloy products of bar and tube mills, also some sheets and strip. Backed by the Department of Defense, the services are also reviewing proposed marking specifications and will submit them to the steel group for final approval.

NEMA Sees $16.4-Billion Year

The electrical manufacturing industry expects to do a $16.4 billion volume in 1955, which is 5 per cent better than the $15.6-billion business done in 1954 and approximately equal to 1953's record sales.

In 1954, sales in most branches of the industry were below 1953's. Electric appliances, industrial apparatus and electrical insulating materials were down 10 per cent. Electrical building equipment and supplies fell 8 per cent, and insulated wire and cable dropped 5 per cent. Illuminating equipment increased slightly — 1 per cent. Generating, transmission and distribution equipment showed an increase of 3 per cent, and signaling and communication equipment jumped 10 per cent.

The National Electrical Manufacturers Association expects the downtrends of 1954 to be reversed this year for all branches except generating, transmission and distribution equipment. They may slip 5 per cent. NEMA looks for a 5 per cent gain in appliances for 1955 over 1954, a 1-per-cent improvement in illuminating equipment, a 3-per-cent gain for electrical building equipment and supplies, a 9-per-cent boost for insulated wire and cable and a 10-per-cent climb for electrical insulating materials. Industrial apparatus sales should rise 6 per cent, and the signaling and communication equipment volume show an increase of 5 per cent.

Sylvania Technologist

"Here's the part you're now assembling . . .

Make It Right . . .

DO THE PEOPLE who work in your plant know what happens when they do a poor job?

It's an industrial adage that workers who know the results of their labors take more pride in their jobs. A new way for putting the idea across to electronics workers is described by Charles W. Hosterman, assistant general manager of the Electronics Division, Sylvania Electric Products Inc.

Good and Bad—Small groups of workers are assembled in a conference room. A demonstrator discusses details of the work they perform and points out typical manufacturing errors. For demonstrating he uses large scale mock-ups of TV parts and assemblies the workers make, such as the big tube grid shown in the photograph.

Then, on television sets mounted side-by-side he demonstrates what happens to the picture when a bad part gets in the circuit. Engineers' terms for electronic effects such as "bounce, hula or venetian blind" quickly become a part of the shop vocabulary.

Sessions aren't confined to shop workers. They are held for engineers, foremen and supervisors at higher levels. Right down the line there has been increased respect for tolerances, specifications and good workmanship.

. . . because here's what happens with a poor job."

Industrial Components

CONSUMERS TELL OF INVENTORY CHANGES IN THE LAST THREE MONTHS

STEEL'S QUARTERLY SURVEY	BETTER	SAME	WORSE
	Air, hydraulic cylinders Electrical equipment	Antifriction bearings Belting, belt drives Castings, die Castings, gray iron Castings, malleable Castings, nonferrous Castings, steel Couplings, hose Fasteners Forgings Gears Elec. motors (fractional) Elec. motors (1-5 hp) Elec. motors (over 5 hp) Rubber goods, mechanical Screw machine products Springs, wire shapes Stampings Weldments	

Inventories Come Into Balance

Users planning increases outnumber by almost four to one those still making cuts. But more than half of respondents intend to keep stocks at present levels

MORE INVENTORY BUILDING during the coming quarter is indicated by STEEL's latest quarterly survey of industrial components. It's a continuation of a trend that began last quarter when roughly 3 per cent of respondents added to inventory.

Also pointing to further gains are a continuing trek into the 30 to 60-day supply column and a marked movement into the 60 to 90-day grouping. Most changes were at the expense of under-30-day categories, though there was a small drop in the number of consumers holding more-than-90-day inventories.

Confidence—On the whole, the survey points to a continuation of the present upswing in business. Ninety-nine per cent of respondents figure their inventory-sales relationship at the end of first quarter will be as good as, or better than, it was at the end of last. Of those, almost 40 per cent figure it will take a bigger inventory to do the job. Less than 10 per cent plan to make further cuts in total inventory.

But like a lot of good news, there's a catch to it: The build-up in inventory will be small, most likely less than 5 per cent. There are four reasons for thinking that: 1. More than half of the respondents plan no further increases. 2. While 37 per cent plan increases, that's not many more than those that figured the same way three months ago. 3. Roughly 20 per cent of consumers still plan stock reductions on one or more components. 4. Deliveries are still generally good, though some longer lead-time and specialty items show signs of tightening.

Deliveries — Whether the few present delivery troubles will spread is hard to tell. Most current complaints seem to be about items closely allied to the automotive industry, such as malleable castings, gears, fractional horsepower electric motors and electrical switches and solenoids. If auto output continues at full tilt, it's likely that lead times will get longer.

Components that showed larger than average improvement during the last quarter were air and hydraulic cylinders and electrical equipment parts. Items most affected by continuation of inventory adjustment were belting and belt drives, castings, hose couplings and the larger electric motors.

Balance—But over-all, inventories are in the best balance they have been since early 1953. That conclusion is supported by other surveys.

One of the latest, by Credit Research Foundation Inc., reports that for the first time in years, relatively few (6 per cent) credit executives are concerned about unbalanced inventories.

Now they feel that one of their major problems will be having to deal with marginal accounts in order to meet competition and sales quotas.

Corporate shifts, expansions show materials handling is . . .

Industry with Growing Pains

OTIS ELEVATOR Co. buys Baker-Raulang Co.

Heppenstall Co. will expand its tong production this year.

Phillips Corp., a small, specialized maker of handling apparatus, enters into a unique agreement with Salem-Brosius Inc. to pool production facilities.

Background — What's behind these moves by materials handling equipment manufacturers? The explanation is industry growth. Materials handlers stand today where automakers stood 30 or 40 years ago. Automakers experienced a myriad of corporate changes then. Materials handlers are going through the same process now.

Spokesmen for Material Handling Institute Inc. pinpoint three trends during the last two years: The purchase of firms to round out existing lines, as in the case of Otis; the expansion and concentration of existing lines, as with Heppenstall; moves to permit specialized manufacture, as with Phillips. Prospects are for more of the same in 1955.

The need for rounding out a product line prompted Thew Shovel Co., Lorain, O., to buy Dixie Crane & Shovel Co., Harrisburg, Pa., in 1954. A similar event was Marion Power Shovel Co.'s 1954 purchase of Osgood Co. and its two wholly owned subsidiaries, General Excavator Co. and Commercial Steel Casting Co., all of Marion, O. Marion will supplement its line of machines with power shovels and cranes made by Osgood and General Excavator.

Expansion Required—Aside from broadening of demand, several other factors prompt equipment makers' decisions to absorb other firms. Colson Corp., Elyria, O., bought Service Truck & Caster Co., Albion, Mich., last year. Colson also built a new Elyria plant for truck production and established a Canadian subsidiary in Toronto, Ont. Robert Pritzker, president of Colson, explains: "We broadened our line so that our salesmen could do a better job. We will also strengthen our firm."

A New York materials handling equipment producer solved a knotty problem by expansion. Sales were strong in winter, weak in summer. Operations were stabilized by buying an earthmoving equipment producer with more summer activity.

Intensification—Not all firms meet the dynamic conditions of the materials handling industry by corporate change. Several are reinforcing operations in fields they traditionally serve. Besides the Heppenstall expansion proposal, Barrett-Cravens Co. completed a new $1-million plant at Northbrook, Ill., late last year.

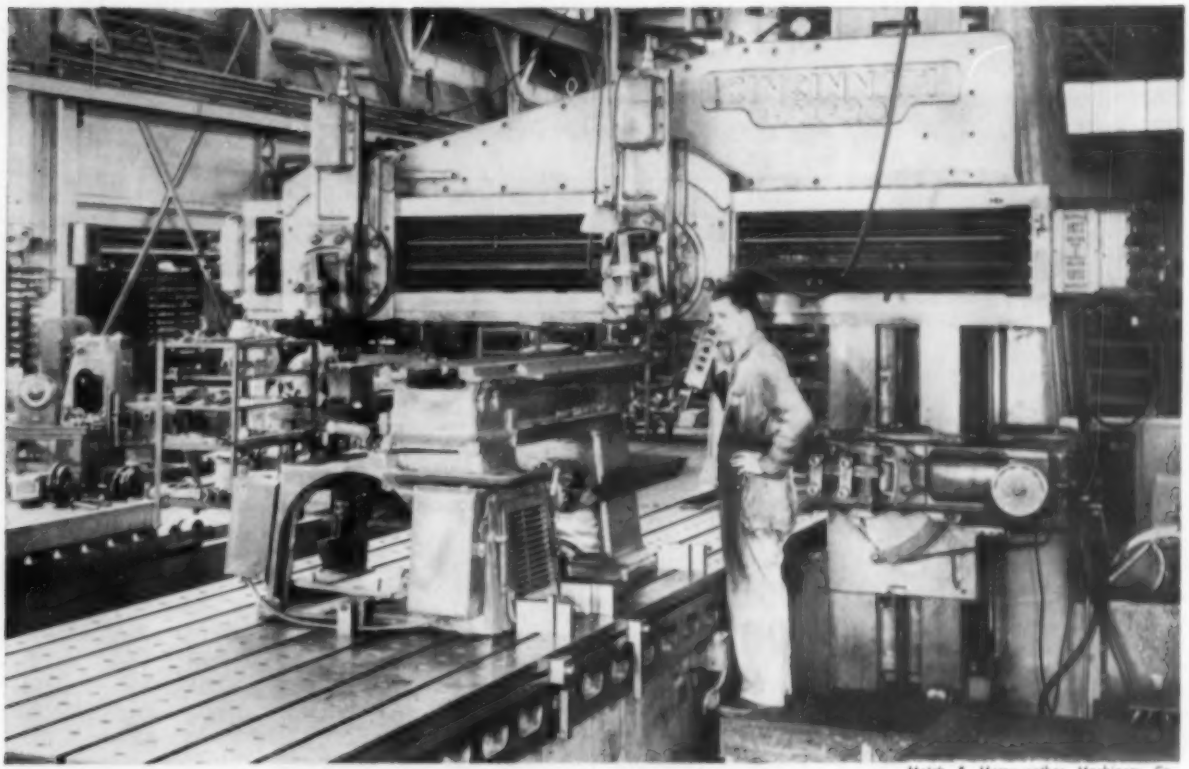
That firm installed facilities at three manufacturing plants, as well as general offices in the Northbrook plant. Advantages of the consolidation include reduction in operating costs, better service through centralized manufacturing and sales activities and integrated design engineering.

Room for More—How can the small, specialized firm compete? Phillips gives one answer.

Automation triggered corporate changes at Phillips in 1954. That firm entered the year as Phillips Mine & Mill Supply Co., historically a supplier of mine cars. Rising demand for automatic equipment caused Phillips to step up production of heavy-duty trailers, concentrate more on materials handling equipment for metalworking and later change its name.

Share Facilities—Phillips also entered a unique agreement with Salem-Brosius in 1954. The firms pooled production facilities at a new Carnegie, Pa., plant without giving up corporate identities.

Materials handling producers sold a record $1250 million in equipment in 1953. Many industry men believe that record should be equaled or broken in 1955.



Hatch & Merryweather Machinery Co.

Orderly disposal of government-owned tools will help put . . .

New Glow on Used Machinery Prospects for '55

AFTER A ROUGH YEAR in 1954, used machinery dealers hope to bounce back in '55.

The industry took its lumps as liberal offerings of government-owned tools hurt the market early in 1954. Special purpose tools used in war production flooded the market as defense needs changed (many are from the aircraft industry, reflecting the trend from reciprocal engines to jets). The auto industry contributed a glut of boring machines as automakers shifted to eight cylinder engines from six cylinder units.

Deprived—Finally, sales of used machine tools were hurt when users of new machine tools were given the advantages of accelerated depreciation while users of used tools were not. (Effort will be made in the next session of Congress to get comparable depreciation for used tools.)

In the climate of the above conditions, plus the general business adjustment, sales of machinery dealers are currently running at about $150 million annually, compared with $300 million in 1951. Other results of the tough year in 1954: Inventories are about 10 per cent heavier than a year ago, though they're also better balanced. Standard general purpose tools are fairly plentiful in most areas. Prices are somewhat lower, probably 10 to 15 per cent over-all. But prices on smaller, general purpose machines are holding up well.

Tough To Compete — Used machinery dealers were caught in the middle last year when new machine tool builders began offering a variety of leasing arrangements after the government had provided for leasing of government-owned tools, too. Some used machinery dealers, the larger ones, were able to follow suit; the smaller operators suffered. Number of established dealers is now about the same as five years ago, according to the Machinery Dealers National Association.

The sale and disposal of government-owned tools is becoming more orderly and spread over a longer period. Many will have to be rebuilt or reconditioned, which will benefit the used machinery industry. The current trend is toward fewer machinery rebuilders (capital investment is heavy) and toward more used machinery reconditioners (less-extensive refurbishing required attracts dealers into this activity).

Ray of Hope—Used machinery dealers hope to be able to clear up some of the localized trouble spots affecting their business (accelerated depreciation, orderly disposal of government-owned tools) so that they can capitalize on the improving business conditions of 1955. This much is definitely in their favor: Generally better inventories of used tools means the dealer should have in stock or be able to get just about any kind or condition of used tool the customer wants.

LP-Gas Sales

	1952	1953	1954
Gallons (in thousands)	4,477,379	4,932,009	5,134,000
% Increase	5.9	10.2	4.1
Domestic & Motor Fuel	2,636,736	2,977,418	3,250,000
% Increase	7.4	12.9	9.2
Industrial Miscellaneous	338,959	374,233	382,000
% Increase	26.0	1.04	2.0
Gas Manufacturing	259,697	222,430	208,000
% Increase	−7.8	−14.4	−6.5
Chemical Manufacturing	870,990	967,427	977,000
% Increase	3.1	11.1	1.0
Rubber Components	370,997	390,501	317,000
% Increase	−1.1	5.3	−18.7

Source: Phillips Petroleum Co.

LP-Gas: Still a Comer

Industry is using more of it as fuel for fork and lift trucks and standby units. Production and storage facilities grow to match increased consumption

SALES OF LP-Gas to all users increased in 1954 despite the adjustment in business activity. The industry is confident its gains will be even better in 1955 with the general upturn of business conditions.

Industrywide sales of LP-Gas (liquefied petroleum gas) in 1954 are estimated at 5,134,000,000 gallons by George R. Benz, Paul W. Tucker and W. F. DeVoe, all of Phillips Petroleum Co. That volume is 4.1 per cent more than in 1953.

Where and What—Sales in the industrial and miscellaneous category amounted to 381,718,000 gallons in 1954, up 2 per cent over 1953. Because of natural gas pipeline extensions or increased pipeline throughputs, the industrial LP-Gas load itself was down slightly from 1953. Another factor in the decline was that one major industrial use—heat treating—evened off its consumption in 1954. However, applications in the miscellaneous usages more than offset those dips, and the net increase of 2 per cent resulted.

Cited by Messrs. Benz, Tucker and DeVoe as one of the growing miscellaneous applications are the "standby" plants being used as protection against interrupted gas service. Also, a major railroad has stated that propane is an ideal fuel for the gas turbine locomotive since practically no maintenance is required, but the company does not contemplate using LP-Gas as a fuel under present conditions of supply, storage and cost as compared with other fuels.

Significant — Largest gains in usage of LP-Gas came in motor fuel. It's estimated these sales increased 25 per cent over 1953's (these are combined in the table above). That would mean LP-Gas consumption as a motor fuel amounted to nearly 625 million gallons or over 12 per cent of total sales. There are more than 2500 busses, 200,000 tractors and an uncounted number of trucks and taxicabs operating on LP-Gas.

One reason for the growth of LP-Gas as a motor fuel was the conversion of industrial tractors, lift trucks and engines driving over-the-road cargo truck refrigeration units. Among the companies that have converted lift trucks during the year are Lockheed Aircraft Corp., Johns-Manville Corp. and Ford Motor Co. Probably the most important factor in the conversion of lift trucks is the elimination of exhaust fumes. The first two LP-Gas fueled lift trucks to be approved by the Underwriters' Laboratories were announced in 1954.

Covering Demand — Behind the growing consumption of LP-Gas is a parallel increase in production capacity and storage facilities. Twenty new sources of LP-Gas were completed or nearly complete in 1954, with a total production potential of more than 700 million gallons. It's estimated that 15 new plants will be added in 1955, with a product potential of upwards of 200 million gallons.

At the same time storage facilities for LP-Gas are at an all-time high. Total storage in use at the beginning of 1955 was 458.4 million gallons, compared with 246.0 million gallons at the start of 1954. Including storage under construction, the industry on Jan. 1, 1955, had 598.9 million gallons of storage capacity.

Strike Losses Drop in 1954

Some 3450 work stoppages beginning in 1954 directly affected about 1.5 million workers for an estimated 22 million man-days of idleness.

Compared with 1953 figures, that's a decline of about a third in the number of strikes and workers affected and about a fifth in the amount of idleness. The largest volume of stoppages occurred in 1952 when 5117 were recorded. Peaks in workers involved (4.6 million) and man-days of idleness (116 million) came in 1946.

The stoppage accounting for the greatest idleness involved some 60,000 West Coast lumber workers for almost three months. The 51-day strike of Goodyear Tire & Rubber Co. workers in July and August and the 29-day stoppage of longshoremen in New York last March were the only other walkouts directly causing more than 500,000 man-days of idleness.

Limited Production—Skin fitting

Layout—Template development

Layout—Master assembly development

Layout—DC-7 scoop development

Limited Production—DC-7 scoop modification

Co-operation Makes Better Aircraft

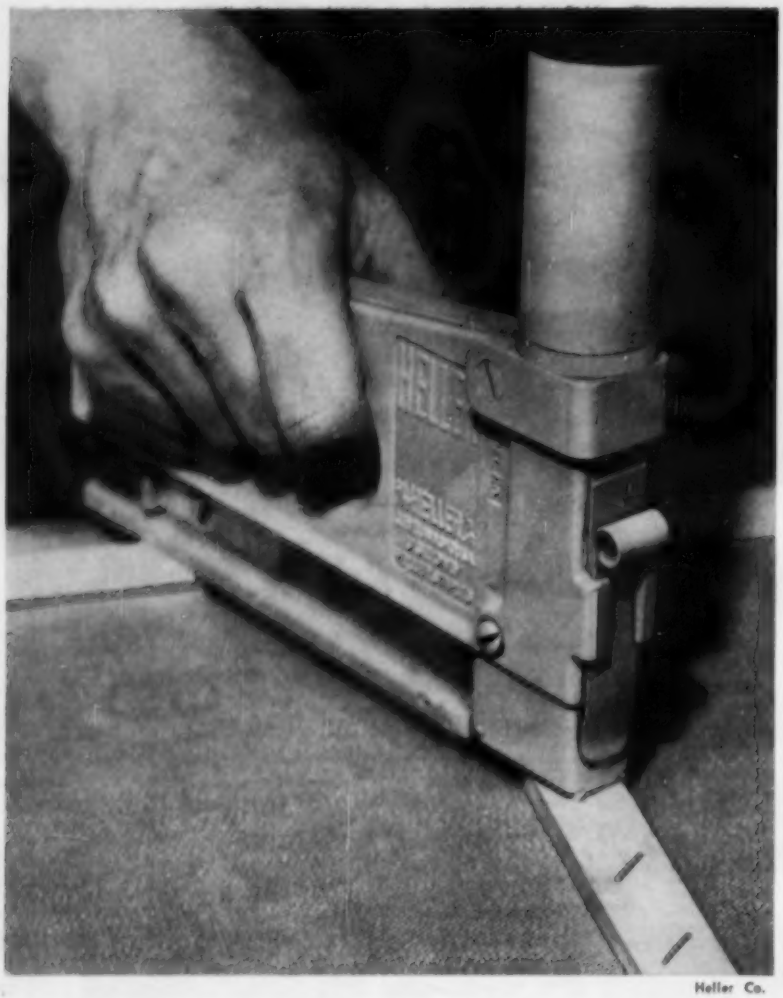
TWO DEPARTMENTS at Rohr Aircraft Corp., Chula Vista, Calif., work so closely together it's hard to tell them apart. Layout manufactures tools; Limited Production is a side eddy of the assembly lines, but together they form a special production team.

Layout is a clearing house for new tools. It makes up master parts and develops templates for production departments. They are stamped and coded with such detailed information that production seldom needs blueprints.

Tryout—Limited Production performs test runs on tools made by Layout. If there's anything wrong, the two departments work together to make it right before the tool goes into the main assembly lines.

At the same time, Limited Production takes on the job of modifying already manufactured units to keep pace with latest design changes.

Layout—Determining trim lines



Heller Co.

Because they put the squeeze on production time . . .

Staplers Sew Up Big Sales

THE STAPLING MACHINE industry clinched $30 million in sales during 1954 and expects to increase that total this year for a new record.

The 1954 dollar volume includes sales of staples and wire in coils for machines forming their own staples. About 20 companies manufacture all types of staplers, stitchers and tackers. Some make only one type machine; others make several. Bostitch Inc., Westerly, R. I., for example, builds more than 800 standard models.

Hefty Sales—To make an estimated 1.7 million machines (both manual and power-operated) last year, the stapling machine industry used an estimated 4000 tons of steel. But the machines themselves will drive close to 12,000 tons of coated low carbon wire in preformed staple strips and even more from coils for machines forming their own staples for stitching heavier work.

That's because stapling machines consume wire many times their own weight in most applications.

Billions of Staples—At peak production, one of the large producers of preformed staples will consume better than 20.5 tons of wire per day in forming 193 million staples. The industry as a whole produces annually over 50 billion preformed staples.

Each of the tiny fasteners has been engineered for the job it must do. Wire for preformed and machine-formed staples is specified to exact size (tolerances are held to 0.004 in. on heavier gages and 0.001 in. on finer gages) and grade for efficient fastening. While the bulk of wire is zinc-coated low carbon steel, surface finishes also include tinned, copper clad or washed, with minor quantities of nonferrous, bronze and monel. There are more than 150 sizes and types of staples: Usual crown widths vary from ⅛ to ⅞ in., with leg lengths of 5/32 to ⅞ in.

Reasons for Demand—The largest consuming market for stapling wire is for shipping and packaging, though there are more than 8000 know applications. Use of power-driven machines is steadily increasing in the industrial field. Metal stitchers can punch a staple through metal and automatically clinch it on the underside at a rate of one-fifth second per stitch.

Wire stitching, long accepted for fastening metal to felt, leather, rubber and textiles, is making more headway in metal-to-metal stitching, notably where limited shear is set up under stress. Steel (cold-rolled sheets or strip), copper, brass and aluminum are being metal stitched for a growing number of assemblies. One of the latest applications in the light-type metal stitching field is a looped staple which itself becomes a terminal point after being machine-driven into an electronic or television assembly.

Markets on Wheels—In the assembly of some automobiles, over 1000 machine-driven "staples" are used for fastening weather stripping, molding channels, antisqueak shields, heater ducts, glove boxes, arm rest foundations, sun visors and for tacking upholstery.

For heavy duty and long continuous automatic stapling through metal, wood and fiberboard, the horizontally fed stitcher head—like the Bostich-Bliss head—was developed. That type head is recognized as one of the strongest and longest operating. Machines with that head consume steel stapling wire at rates up to 30 lb per hour per head.

U.S. Pushes Titanium Production

Federal bankroll will backstop companies erecting specialized plants. Complete titanium procurement program is under government review

INDUSTRY'S INVESTMENT in specialized plants for producing titanium ingot and rolled shapes will get a big boost if new government plans go through.

Concerned over complaints of inconsistent quality from aircraft manufacturers and other users, the General Services Administration has worked up a contract putting the federal bank roll squarely behind any company that will erect melting capacity or rolling facilities expressly designed to handle titanium.

Terms and Bidders—Subject to Office of Defense Mobilization approval, the plan will work like this: XYZ company puts $1 million in a titanium processing plant and fails to get enough profitable business to amortize its investment over the 5-year fast tax write-off period. The government will then underwrite up to 90 per cent of the total investment, putting XYZ Co.'s maximum loss at $100,000.

Four concerns have already submitted proposals for titanium melting facilities. It is expected that contracts will be let just as soon as ODM gives the green light. Republic Steel Corp., Mallory-Sharon Titanium Corp., Titanium Metals Corp. and Rem-Cru Titanium Corp. are companies showing interest in building rolling facilities.

Growing Pains—This GSA plan is but one indication that all phases of the titanium procurement and processing program are undergoing critical reappraisal. There is considerable uncertainty about specifications for sponge titanium, and grades A, B and C are currently under review.

The related question of quality and quantity of sponge needed for melting with scrap is also being studied. Preliminary findings are that supplies of titanium scrap will always be large, with as much as 60 per cent of rolled output being returned as regular procedure. Much depends on the development of less wasteful forging techniques.

Competition the Key — There's another hot controversy brewing about the inclusion of titanium sponge in the list of products on which the United States may offer concessions to Japan in the tariff negotiations immediately ahead. At present, we are importing about 10 tons of Japanese sponge monthly, which is all Japan has available for us. If we held out a more friendly tariff hand, it's likely that Japanese production would be expanded.

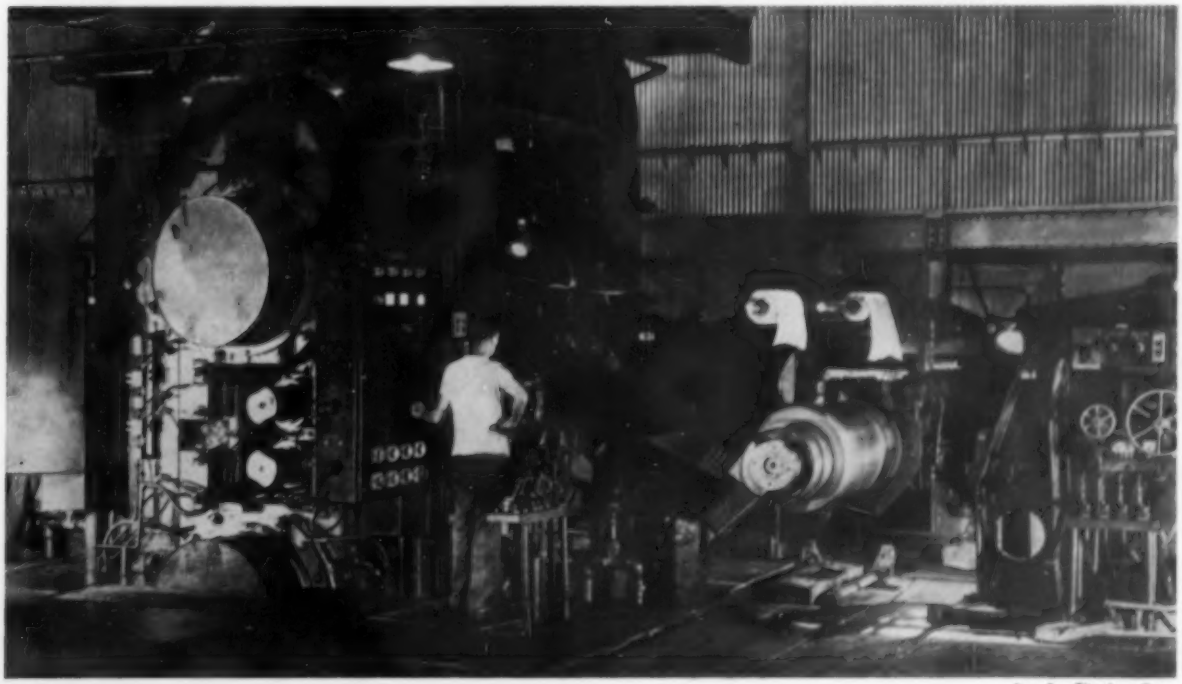
But many authorities feel that just such an event would provide the competitive fillip needed to push the infant American industry. They're betting on continuing research and development by private industry—Republic Steel's new rutile finds are one hot example—to pay off in the long run.

November Tool Orders Slip

Machine tool orders in November dropped to a 4½-year low.

Incoming business amounted to only $35 million, smallest since May, 1950, just before the Korean outbreak. For all 1954, new orders are indicated at $535 million, down 38 per cent from 1953.

Government spending is expected to improve the picture over the next few months. Washington plans to place contracts for $150 million of elephant tools.



Rem-Cru Titanium Corp.

By E. C. KREUTZBERG Washington Editor

Bell Telephone Lab's Honaman: His job's to . . .

Plug Leaks of Technical News

IS THE U. S. giving unfriendly countries too much of its technological know-how through public channels? Or, to put it another way, should there be more curbs placed on the information being published by the technical press in this country?

A perennial question in Washington, it's up again for study, this time at the suggestion of the cabinet-level National Security Council.

New Approach — The problem has been handed to Secretary of Commerce Sinclair Weeks who, in turn, has set up a new Office of Strategic Information to seek possible answers. Director of OSI is competent R. Karl Honaman, on loan from Bell Telephone Laboratories, New York.

Under scrutiny: Unclassified information published in technical and business magazines of the type frequently found in manufacturers' catalogs. The security council feels that many recent articles may help our enemies to shorten the time lag in getting abreast of our advanced weapons and production methods. For example, they refer to technical information stemming from U. S. use of radar, development and control of guided missiles and the use of electronic instrumentation in stepping up output of manufacturing plants by automation techniques.

Definition — Censorship is not involved, says the Commerce department. Secretary Weeks puts it this way: "The government will work with the business community in voluntary efforts to prevent unclassified strategic data from being made available to foreign nations which might use such data in a manner harmful to the defense interests of the U. S."

Mr. Honaman is still in the exploratory phase of his study. Currently, he is discussing the question with government officials. Later, Mr. Honaman will hold discussions with editors and publishers of technical and business magazines. On Jan. 20, for example, he will make his presentation to the Society of Business Magazine Editors.

It may be that before the study is finished, some government officials might propose broadening the existing security system.

Dubious Future—What can be accomplished through a form of self-censorship (or whatever it's called) remains to be seen. Historically, business paper editors have been balky on this point—for two reasons: 1. To uncover and give their readers technical news is their prime function. 2. Criteria for self-censorship often have been fuzzy and difficult to limit.

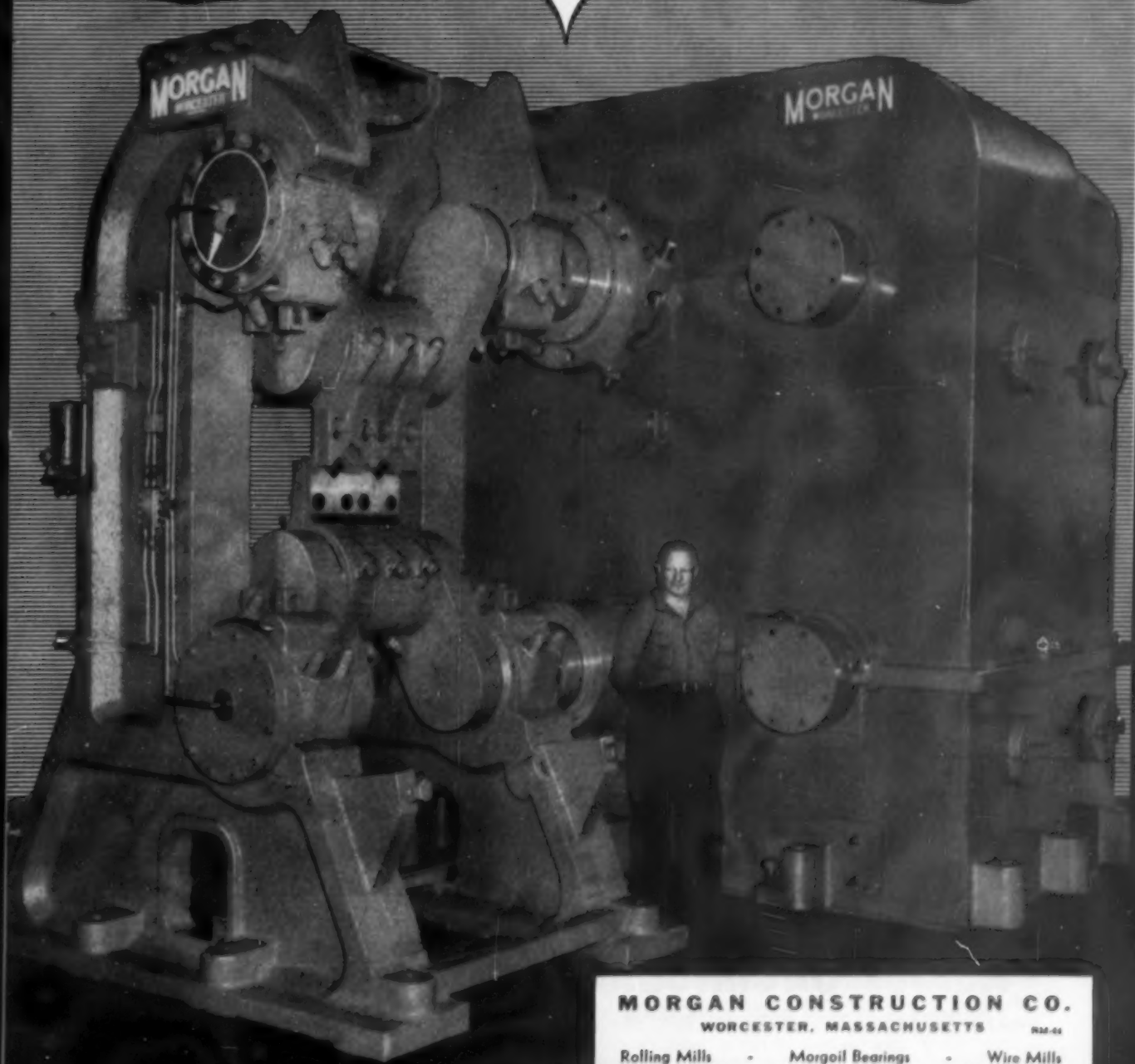
J. Russell Wiggins, managing editor of the *Washington Post & Times-Herald*, and chairman of the Freedom of Information Committee of the American Society of Newspaper Editors, already has gone on record by declaring: "The government ought to drop this proposal."

Readers Lose — The general feeling among editors is that censorship, voluntary or otherwise, is not the way out of the dilemma. When you censor to deprive the enemy of news, you also withhold the news from your own people. That would tend to hold up progress at home.

The proper method, say these editors, is a policy of full information that will help us hasten our own technological development and keep ahead of the enemy.

A Morgan Flying Shear...

. . . made possible the *first* continuous rolling of billets and slabs in 1892. Operated by steam this was to be the first of many shears of this type used in billet, rod and merchant mills throughout the world. Unchallenged in its field for 62 years, Morgan has now adapted the miracle of modern electronic control to achieve a new flying shear to take its place as another Morgan contribution to the art of continuous rolling.



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WORCESTER, MASSACHUSETTS RM-44

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This superior brick has been *especially designed* to withstand sub-hearth conditions. Thus, it gives maximum protection against costly breakthroughs and provides longer sub-hearth life.

All the important properties outlined by major steel company ceramists as most desirable for sub-hearth brick are found in Permanente Periclase D-S Brick.

High MgO (more than 95%) is achieved through the use of pre-shrunk, accurately-sized Periclase grains derived from sea-water magnesia. Absence of chrome eliminates the reduction of chromium oxide and damage to the refractory structure.

Low iron content minimizes refractory damage from alternate oxidation and reduction of iron oxide and other iron compounds. Absence of calcium oxide prevents damage caused by slaking during slow heat-ups or while furnace is idle.

With all its many advantages, Permanente Periclase D-S Brick gives you the ultimate in sub-hearth safety and durability—*yet costs no more!*

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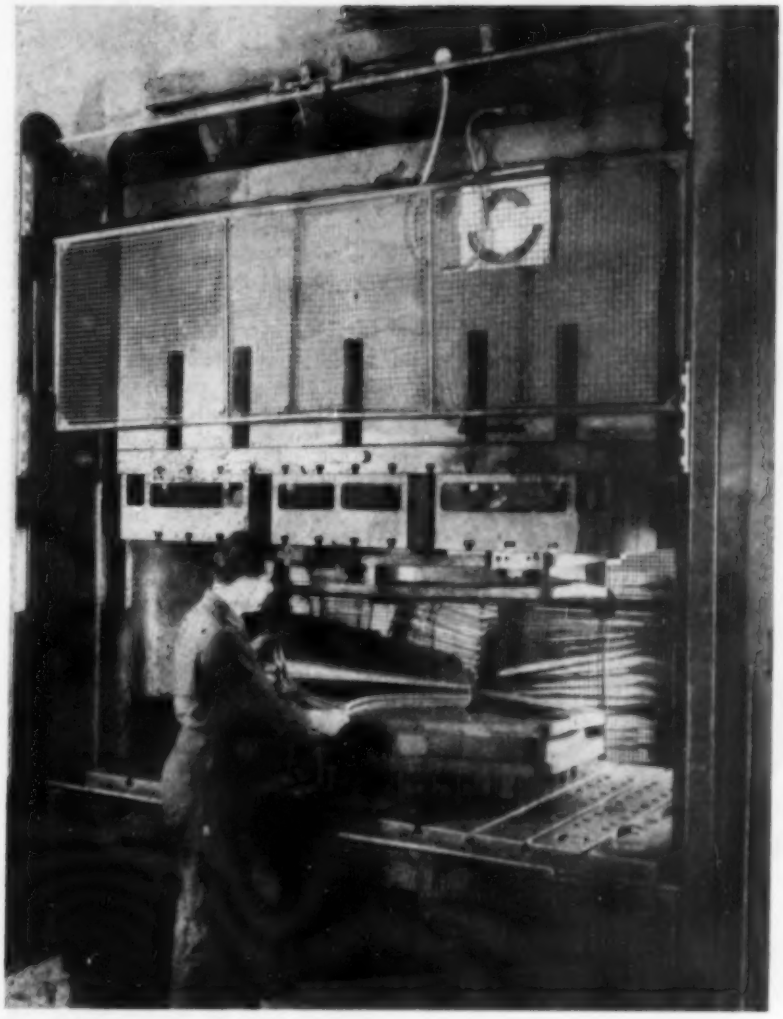
- Permanente Periclase Chrome Brick (PCA)
- Permanente Chrome Periclase Brick (CPA)

Now available! A companion mortar for Permanente D-S brick. High purity periclase composition *and* maximum workability.

Installation advice on request



A 400-ton blanking press, built by Wilkins & Mitchell Ltd., and installed at the Forward Radiator Co., Birmingham, England, produces body stampings for the British auto industry. This press is a link in the shipment of 20 per cent of 1954 British steel output. That's the percentage of British steel production exported as indirect shipments (autos accounted for biggest share of those exports). About 15 per cent of British steel output in 1954 went overseas as direct exports.

ECSC Starts Using Its U.S. Loan

First dispersals of the $100-million loan from the Export-Import Bank to the European Coal & Steel Community have been made. Purpose: To lower price of ECSC steel

COAL AND IRON mining companies in the European Coal & Steel Community will be the first to feel the impact of the $100-million loan to ECSC from the Export-Import Bank of Washington.

First dispersals from that loan were made during the last week in December, 1954. Though the end purpose of the money is to reduce production costs of steel and metal products in the ECSC, loans were made to the industries which supply raw materials to steel producers instead of directly to the steel industry itself.

Split—Of the $59.8 million dispersed, more than half ($32.8 million) went to West Germany, $21 million went to France, $5 million went to the Saar and $1 million went to Luxemburg. Italian and Belgian requests are still under consideration. Netherlands industry hasn't applied for loans because it can get enough investment capital at reasonable rates elsewhere.

By industry, the $59.8 million was to be distributed this way: $26.9 million to power plants, $23.3 million to coal mines and coking interest and $9.6 million to iron ore mines.

For the Rest—Of the remaining $40.2 million in the Export-Import Bank loan, the ECSC has set aside $25 million for housing projects in mining areas. That leaves about $15.2 million to be made in loans this year, including those prospective ones to Italy and Belgium.

Steelmakers in the U.S. will be among the last, though certainly not the least, to feel the impact of these loans. The avowed purpose of the borrowing is to reduce prices on Western European steel, metal which competes often with American steel.

Areas for Attention

One of the main stumbling blocks to effectiveness of the European Coal & Steel Community is the disparity in shipping charges among the member countries. For example, rates in Germany for shipping coke are 60 per cent more for coke sent to French steel mills than for that delivered to German plants. That and other charges cause French steelmakers to pay $6.90 to freight a ton of Ruhr coke while their German counterparts pay only $3.45. With French steel mills importing 3.3 million tons of coke annually from the Ruhr, French steelmakers pay between $11.5 million and $14.5 million more than the Germans do for the same amount of coke.

An America on the move means . . .

Industry Centers Shift Westward

METALWORKING is on the march, following its markets across the U. S. from east to west. Today, you can spot its geographical center at an 80-car railroad siding called Slicks, in Marion county, Ohio.

If you fell off one of the Pennsylvania Railroad's trains there—they don't often stop—and stood up facing due north, one-quarter of the country's metalworking plants employing 20 or more would be to your front, one-quarter to your right, one-quarter to your left and the others behind you.

Shifting Focus — Latest American Iron & Steel Institute figures place the geographical center of steelmaking also in Ohio, about six miles south of Beaverdam, somewhere near Hog Creek. Like the metalworking center, it has moved steadily across the map from east to west. Since 1847, when it was in Juanita county, Pa., it has shifted toward the west and south at an average rate of six miles per year.

This westward movement of the basic industry centers closely resembles a similar but slower shift in population. In 1790 the population center was about 23 miles east of Baltimore, Md. It has since moved west and south to somewhere near Olney, Ill., at a rate of about four miles per year.

A Hot Future—Since 1900, this rate has slowed by almost half. You can't predict the future with complete certainty, because of the West Coast boom, but it's more than likely that 2000 AD will find the population center at or near St. Louis—if metalworking sells enough air conditioners.

But one thing's certain, metalworking and steelmaking centers will tag along.

GE, Westinghouse See Gains

Optimism keynotes the year-end statements of Westinghouse Electric Corp.'s President Gwilym A. Price and General Electric Co.'s President Ralph J. Cordiner. Both predict their company's sales this year will equal those of 1954.

GE expects 1954 sales to be about 5 per cent below 1953's record $3.1 billion, Mr. Cordiner says, with the decline due entirely to a drop in defense business. However, he predicts GE's civilian business this year will be 5 to 8 per cent better than in 1954.

Westinghouse will wind up 1954 with a record $1.6 billion volume, Mr. Price declares. He predicts a 10-per-cent increase in orders in 1955 over last year.

Industry Dons Cap and Gown

America's biggest educator is U. S. industry. About half the nation's 60 million workers are engaged in some kind of training, says Minneapolis-Honeywell Regulator Co.'s Industrial Division in Philadelphia.

This training, which ranges from apprentice programs to college-type courses, consumes 5 to 10 billion man-hours and has been estimated to cost about $10 million annually. C. L. Peterson, vice president of the M-H division, estimates that 15 million employees are receiving on-the-job training.

Increasing the tempo of this training, says Mr. Peterson, is the need for the higher skills required by automation.

A Private Enterprise

In a private-enterprise sequel to the recent government-level Inter-American Investment Conference, businessmen of America and Latin America will meet in New Orleans Feb. 28 through Mar. 3. Purpose of this "citizens" meeting is to explore the role of private initiative and finance in U.S.-Latin American economic relations.

Rudolf S. Hecht, chairman of the board, International House, New Orleans, said the prime purpose of the conference is to stimulate greater participation of U.S. capital in productive enterprise in Latin America.

Nickel is being saved here; that's why . . .

Bigger Role Looms for Secondary Smelters-Refiners

TAKE A LOOK at the two-fold job the secondary nickel smelting and refining industry is doing:

1. In an era when metal conservation is becoming increasingly important, it's reclaiming nickel from drosses and residues that might otherwise be lost.

2. By doing this job, it's supplying metal to a market already plagued with shortages.

To Increase—Today, the industry supplies an estimated 4 per cent of the nickel consumed in the nation. Its officials believe that secondary smelting and refining—in other metals as well as nickel—will play a greater role in the nation's economy as our natural resources continue to dwindle.

Operations at the Alloy Metal Division of Alter Co., Davenport, Iowa, point up the industry's function. In addition to nickel, Alter produces master and special alloys of copper, chromium and manganese for iron, steel, nonferrous and precision casting industries.

Alter's equipment, which has an annual capacity of about 30 million lb, includes two electric furnaces, a gas-fired crucible and a rotary reverberatory, plus auxiliary facilities which include a lab.

Not Gray Market—"Too often," says Alter's Vice President Arant H. Sherman, "we secondary smelters are classed with the so-called gray market operators. There's nothing gray or shady about our industry — in reclaiming nickel from scrap, our costs are higher than those of a primary producer, and we, therefore, must get a higher price.

"On the other hand," he adds quickly, "the nature of our business also permits us to process certain other metals more economically than a primary producer. For example, we've been producing and selling monel at 15 cents a pound below the primary producers' price."

Operations at secondary smelting and refining plants generally fall into two divisions: Segregation - preparation - blending and melting-pouring. The two divisions contribute about equally to the cost of producing nickel alloys.

Piece by Piece—Since the raw material used is scrap, segregation of the metal according to analysis is necessarily a piece-by-piece hand operation, Mr. Sherman relates. Acid tests are given each piece before the first heat. After blending, the second heat produces the metal specifications. In addition, each heat is given lab tests to assure proper standards and quality for all metal shipped.

More Exports—"Customers for secondary smelters and refiners range from the smallest foundries to the largest steel mills," officials point out. With the rapid industrial recovery in some of the European countries, the industry is also finding its export business up.

What's the outlook for the growth in the secondary smelting and refining industry? Alter is betting it will continue and is adding a new electric furnace and enlarging its lab to back that bet.

HOW HYATTS CAN HELP YOU...

CUT STEEL-MAKING COSTS:

Always specify or replace with . . .

The secret of operating economy is to keep your production rolling at *peak efficiency*—and what equipment has more bearing on this than the hidden bearings you so seldom see or think of? (Seldom, that is, until one fails and writes its record in red on your cost sheet!)

That's why so many major steel mills standardize on Hyatt Roller Bearings in their rolling tables, lineshafts, cranes, motors, cars and similar vital applications. Down through the years, Hyatts have conclusively proved they *save power—extend equipment life—last longer with less maintenance.* In the long run, the *best* bearings you can buy are the most economical—HYATTS!

HYATT ROLLER BEARINGS

STRAIGHT ▭ BARREL ⬭ TAPER ▽

HYATT BEARINGS DIVISION • GENERAL MOTORS CORPORATION • HARRISON, NEW JERSEY

The Thunderbird gets assembled in the same line with regular Fords, showing . . .

How Customized Output Can Be Mass-Produced

THE INCUBATION of a Thunderbird is a process almost as interesting as the car itself.

The Ford approach stands in apposition to that of Chevrolet, which builds its Corvette at St. Louis on a special assembly line. (See STEEL, July 19, 1954, p. 65.) That's because back in the days when process engineers were first sitting on the Thunderbird eggs, it was reasoned that existing facilities could be modified more cheaply than completely new facilities could be built. New equipment was added only for trim at the Dearborn plant. Regular production facilities were modified for paint and final assembly.

Another Major Difference—The Corvette plastic body is built by Chevrolet from supplier-fabricated parts. Ford decided to buy its steel body complete from a supplier —first from Murray Corp. of America and now Budd Co. Budd, incidentally, had been out of the body business for many years. It once made 300 bodies per day for Plymouth back in 1929. Lately it has concentrated on stampings and wheels for the automakers.

With Budd's facilities for stamping, making the 184 body stampings was a relative snap. Steel dies are used, by the way, though the volume of 25,000 units annually might well warrant Kirksite or plastic on some parts. When you add 74 purchased parts to the 184 Budd makes to comprise the body shell, putting the bundle of Thunderbird feathers together could be like trying to reupholster a chicken.

How It's Done—The answer is about 70 fixtures in which subassemblies are carefully built up into finished major body parts and finally into the bodies themselves. To do this job, Budd took the tooling partially delivered to Murray, along with Ford-developed assembly plans and laid out a Thunderbird body line. Tooled for a basic production of 48 bodies in an eight-hour day, this assembly line is a striking example of mass production that isn't.

With circumstances as they are, the Budd answer seems an excellent compromise. The extensive use of fixtures facilitates good dimensional accuracy, while plenty of hand spot-welding guns avoid the cost of welding presses. Work flow is keyed to the body assembly, with components entering the main line at the point they are needed.

Sequence—Buildup begins on

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bucks, with the floorpan center section joined to the dash and rear trunk pans. The subassembled side sections join the floorpan early in the sequence, and the front and rear cowl and deck parts are added —after which the body can stand alone. The side assemblies consist of front and rear fenders with the rocker panel and a support bar across the door opening, which is removed only when the body is received by Ford.

Transfer from one station to the next during the body buildup stages is by overhead tramrail. Work is planned to be completed at each fixture in about the same length of time, so a musical-chairs type of progression is possible. After leaving the final framing fixture and receiving an inspection of welds with gas and electric touchup, the bodies transfer laterally by roller conveyor to a knee-high floor conveyor. This unit is 24 bodies in length and includes a ventilated booth for solder grinding astride the line.

Particular—Workmanship on the body finish line is notable for its unhurried, craftsmanlike approach with fastidious attention to detail. Fit of doors, deck lid and hood receives close attention and leaded surfaces portray this operation as an art. All body surfaces are checked by a veteran inspector using the familiar sensitizing cloth mitt, which quickly betrays surface roughness difficult to detect with the eye alone. Several bodies were shunted aside at the end of the line, with areas circled for repair which to the casual observer appeared flawless.

Receiving final approval and mounted on shipping skids, the bodies (in white) are trucked from Budd Co. to the Dearborn assembly plant of Ford where they enter the Bonderite process just like bodies fabricated on the spot. This is possible because the Thunderbird body, complete with front fenders, happens to be just 1 in. longer than the station wagon bodies without front fenders. Adaption of the conveyor fixtures to receive the Thunderbird bodies makes possible their trip through the paint setup like the normal body, and they receive standard paint and paint-finishing operations.

Exception — Emerging from paint, the bodies make their one divergence from normal production flow. Trimming the Thunderbird involves special parts inventory and certain custom touches, like the leather-padded dash, which require time and talent. Thus, the Thunderbird has its own special plumage department, replete with glass fiber and convertible tops which are installed before the body is dropped.

Once trimmed, the Thunderbird body resumes the normal Ford-works trip, being dropped onto its chassis at the normal body drop despite the presence of the front fenders. The chassis, meanwhile, has come down the normal chassis line, though it is a maverick to say the least. In addition to the 198 hp engine, such items as special frame, smaller front suspension and shorter drive shaft are among the chassis differences coped with.

No Problem—After the body is decked, the exceptions to normal Ford assembly include the installation of radiator and then the fan, steering column and tailpipe extensions. But workers accustomed to such options as power accessories, engine modification kits and color choices find the Thunderbird no particular problem.

Perhaps the most notable feature of Thunderbird assembly in relation to the other operations at Dearborn, however, is the fact that production of Ford "Thunderbird inspired" models has not been diminished. Capacity has been increased six units per hour to accommodate the Thunderbirds. Two of every 25 cars assembled on the final line are Thunderbirds, while in paint every 12th station wagon body isn't; it's a Thunderbird instead.

What's Ahead?—To accomplish the feat, conveyor fixtures on both the paint and final assembly lines had to be modified for Thunderbirds throughout, with the line speed increased the six units per hour mentioned above in both cases. Should the demand for Thunderbirds continue to outstrip production, it appears that Ford will be faced with the problem of shifting from station wagon output since this facility is the limiting factor. Budd could turn out 90 bodies per day contrasted with the 54 it is now producing for the Ford 9-hour operation.

But as things are going now, the Thunderbird is incubated with a minimum of ruffled feathers.

Auto, Truck Output

U. S. and Canada

	1954	1953
January	594,789	614,000
February	573,801	628,017
March	672,485	752,149
April	676,233	782,491
May	621,349	684,843
June	623,732	713,778
July	543,534	756,592
August	523,799	640,186
September	364,441	605,228
October	312,078	651,153
November	616,394	458,567
December	749,000*	529,588
Total		7,816,592

Week Ended	1954	1953
Dec. 4	171,189	123,148
Dec. 11	176,075	113,145
Dec. 18	180,087	132,093
Dec. 25	149,418	92,247
	1955	1954
Jan. 1	148,390†	93,293
Jan. 8	176,000*	152,418

Source: Ward's Automotive Reports. †Preliminary. *Estimated by STEEL.

Buick Century: Wheelspin Plus

The 1955 Buick Century is the 1954, plus more of the same. With the new variable pitch Dynaflow the machine digs up to 60 mph in about 10 seconds, which puts it among the fastest traffic light artillery. Yet the smoothness with which the acceleration is delivered is something comparable to releasing the tension on a coiled spring.

Speaking of coiled springs, the Buick retains its torque-tube drive. Chevrolet went to Hotchkiss this year, leaving it and Nash the only two remaining exponents. This continues the boatlike ride, though the car has evolved from a barge to a nimble runabout. Handling is good. Coupled with amazing passing torque (particularly if the almost unnecessary variable pitch is used) the car racks up amazing averages on trips.

Luggage space is every bit as ample as the lines of the car suggest. Though David Buick began business as a builder of bathtubs, Buick today has turned the business upside down.

Blueprints call for bearings?

Call on NEW DEPARTURE

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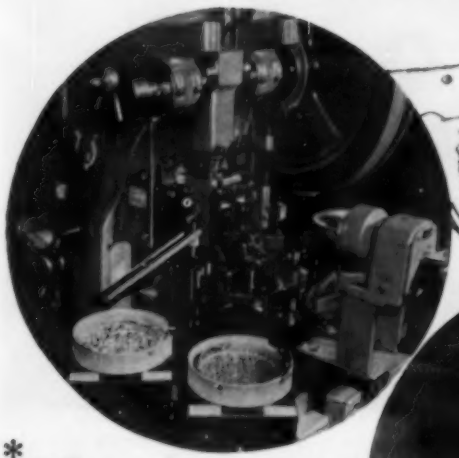

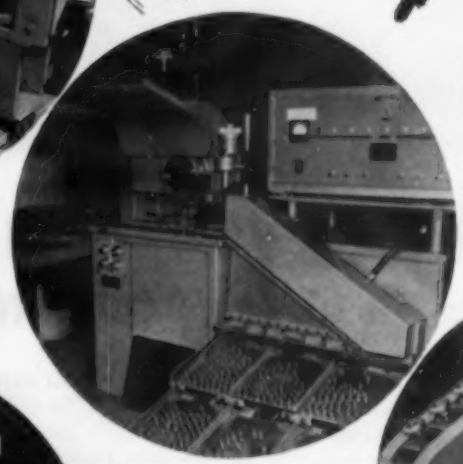

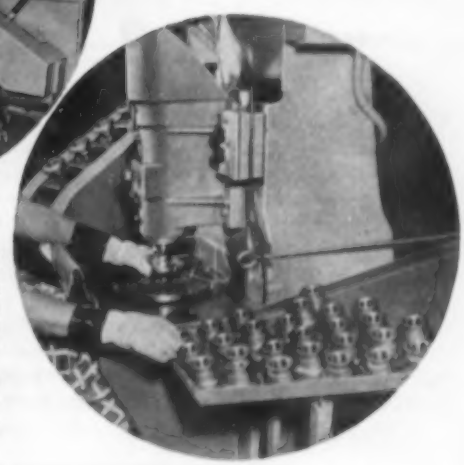

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* **DELIVERY!**—Electronics work at New Departure! Bearing races are speedily sorted into six dimensional classifications by this machine. Volume is up because New Departure invested in this modern equipment.

* **QUALITY!**—Painstaking quality control, at every manufacturing step, works to approach perfection in every bearing. Here you see an electronic inspection of operational noise level. Any sub-standard part is automatically rejected. There's no chance for error. You are sure of top quality—every time!

PLUS ENGINEERING SERVICE—There's no substitute for experience . . . and New Departure offers you an unmatched backlog of accumulated ball bearing knowledge. So whenever the prints call for ball bearings, check with New Departure for engineering assistance in bearing selection and application. Phone, wire or write . . . you'll get action from New Departure—PDQ!

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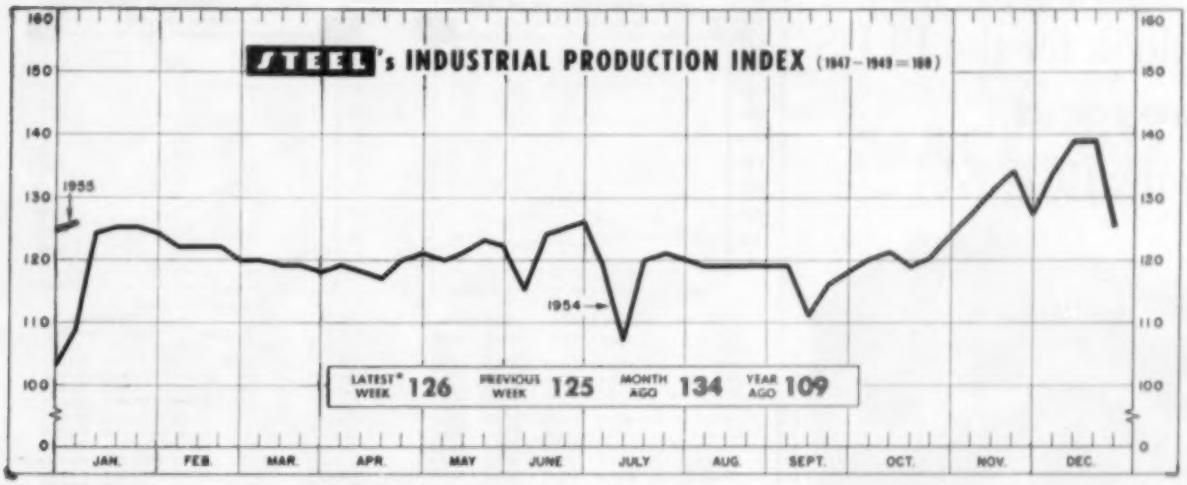
YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



*Week ended Jan. 1.
Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 11%

High Production, Optimism Usher in 1955

THE NEW YEAR is off to a good start. There's little doubt of that.

Steel production wheeled in at better than 80 per cent of capacity. Pushing it along was the auto industry, which plans to make January the third biggest production month in history. Construction, helped by a smaller than usual winter dip, is set for an even bigger year than record 1954. In other lines of business, inquiries are turning into orders, and inventories show a slight tendency to go up in response to lengthening delivery on some items.

For metalworking, the outlook is good, with a return to 1953 volume likely.

Pacemaker—Pacing the industry are autos. The third-best year in history is in prospect. Consumer reception of 1955 models has been good, even better than expected in some cases. The Independents get back into the race this month. Their rising production will kick up output totals, but it will take a while to see whether mergers will have the hoped for beneficial effect on sales.

Meanwhile, the Big Three are rolling in high gear. Chrysler Corp. is scheduling 6-day weeks in most divisions, 7 days on some trouble spots. Ford made more cars in December than in any postwar month, and General Motors checked off the biggest month in its history.

Improvement — That helps explain the pickup in the labor picture. But along with autos, other metalworking groups showed improvement, says the Labor department. Machinery and instruments registered gains, lending support to predictions of better business in 1955. Primary metals, metal fabricators and ordnance showed smaller than seasonal employment drops.

Generally, predictions are for fairly good employment during 1955. For example, the National Industrial Conference Board's Economic Forum sees employment at about 62.5 to 63.0 million. Un-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,943	1,850	1,798
Electric Power Distributed (million kwhr)	9,250[1]	9,400	8,200
Bitum. Coal Output (1000 tons)	7,310	9,000	6,515
Petroleum Production (daily av.—1000 bbl)	6,350[1]	6,401	6,234
Construction Volume (ENR—millions)	$346.2	$324.5	$226.5
Automobile, Truck Output (Ward's—units)	148,390	149,418	93,293
TRADE			
Freight Car Loadings (unit—1000 cars)	540[1]	561	478
Business Failures (Dun & Bradstreet, no.)	209	213	150
Currency in Circulation (millions)[3]	$30,638	$30,946	$31,009
Dept. Store Sales (changes from year ago)[3]	+16%	+3%	+12%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$19,205	$23,153	$15,285
Federal Gross Debt (billions)	$278.7	$278.4	$274.8
Bond Volume, NYSE (millions)	$26.4	$18.4	$12.5
Stocks Sales, NYSE (thousands of shares)	18,486	14,169	8,263
Loans and Investments (billions)[4]	$86.6	$86.5	$80.9
U. S. Gov't. Obligations Held (billions)[4]	$37.2	$37.2	$32.7
PRICES			
STEEL's Finished Steel Price Index[5]	194.53	194.53	189.74
STEEL's Nonferrous Metal Price Index[6]	216.0	216.1	205.5
All Commodities[7]	109.6	109.4	110.6
Commodities Other Than Farm & Foods[7]	114.8	114.7	114.5

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1955, 2,413,278. 1954, 2,384,549. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

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beyond

the PRICE!

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Think what it costs when your stampings aren't delivered on time.

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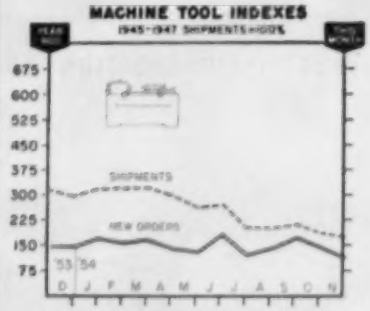
"America's Best-Known Jobbing Stampings Manufacturer"

THE BUSINESS TREND

MACHINE TOOL INDEXES

1945-'47 SHIPMENTS=100%



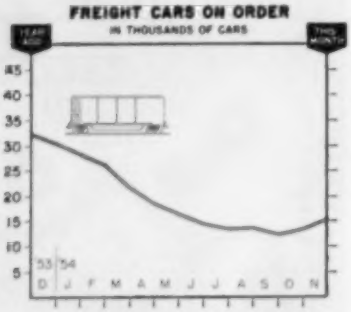
	New Orders		Shipments	
	1954	1953	1954	1953
Jan.	173.5	255.5	319.4	361.6
Feb.	159.5	282.1	323.1	354.5
Mar.	169.6	327.0	327.2	375.9
Apr.	142.5	276.5	302.7	372.7
May	139.5	246.4	270.3	356.0
June	185.2	273.4	276.3	342.2
July	124.7	247.3	205.7	267.6
Aug.	147.9	286.9	203.7	299.6
Sept.	180.9	223.7	213.4	328.3
Oct.	148.9	196.7	191.0	348.4
Nov.	118.9*	146.6	179.6*	320.2
Dec.	....	149.8	....	301.4

*Preliminary.
National Machine Tool Builders' Assn.

Charts copyright 1955 STEEL.

FREIGHT CARS ON ORDER

IN THOUSANDS OF CARS



	Awards		Backlogs (end of month)	
	1954	1953	1954	1953
Jan.	2,942	7,406	27,959	77,414
Feb.	2,057	2,284	25,441	71,882
Mar.	348	3,247	20,966	68,553
Apr.	909	2,102	17,817	62,637
May	1,071	1,645	15,615	57,345
June	1,139	1,453	13,860	52,315
July	883	1,671	12,889	47,422
Aug.	2,425	3,913	13,013	45,735
Sept.	2,396	3,867	11,993	42,198
Oct.	2,704	1,705	12,853	35,171
Nov.	3,754	2,855	14,805	31,869
Dec.	....	2,159	.....	29,950
Total	....	34,310		

American Railway Car Institute.

employment is placed at about 3 million in the early part of the year, with some improvement in the second half.

No Indication in Sight . . .

But the CIO sees "no indication that a return to full employment is in sight." A requisite for full employment is increased consumer spending, the labor union says in its "Economic Outlook."

It recommends an 11-point program, mostly by the government, to attain this increased buying power. Among the proposals: "Gains in wages and working conditions, adoption of guaranteed annual wage plans, designing a tax policy to strengthen consumer buying power, 2 million new housing units a year."

Also called for were improved social security, a national health program and a minimum wage of $1.25 an hour. Higher farm supports and unemployment compensation, plus government aid to chronically distressed areas, were on the list.

Needed: More Spending . . .

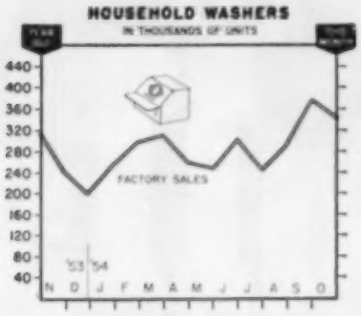
Two of the reasons the CIO says higher consumer buying power is needed are: Lower government spending and lower capital equipment spending by business.

And there will be a drop in capital spending this year. Indications of how big the dip will be are provided by the Commerce department's *Survey of Current Business*. It places business spending in the first quarter of 1955 at a seasonally adjusted annual rate of $26 billion. Actual spending is pegged at about $6 billion, which is lower than any quarter of 1954.

The decline is centered in manufacturing, mining and public utilities. But there are a few bright spots. Durable goods producers show signs of slowing the downward plunge of their spending. Railroads seem to be reversing their direction. A slight increase is in the offing for first quarter, but that gain still won't bring spending up to first-quarter, 1954, rates. A good share of the drop is in lower orders for locomotives as the roads near complete dieselization.

The railroads' business, though, seems to be due for some improvement in 1955, and that may foreshadow a pickup in buying later in the year.

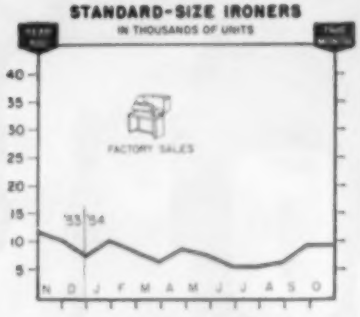
But plenty of optimism for 1955 is voiced in the report of the Busi-



Sales Billed—Units

	1954	1953	1952
Jan.	249,956	277,300	213,998
Feb.	295,171	326,604	255,864
Mar.	307,862	345,989	248,431
Apr.	238,712	288,474	217,211
May	246,944	286,515	213,668
June	303,456	304,086	274,457
July	242,863	228,288	207,593
Aug.	293,243	291,260	254,537
Sept.	379,666	340,532	283,732
Oct.	339,169	310,867	327,814
Nov.	.....	238,155	293,079
Dec.	.....	191,570	310,661
Totals ...	.....	3,429,627	3,101,045

American Home Laundry Mfrs. Assn.



Factory Sales—Units

	1954	1953	1952
Jan.	9,792	24,395	15,636
Feb.	8,208	22,586	17,630
Mar.	6,025	16,066	13,913
Apr.	8,388	14,080	8,938
May	7,210	9,323	12,652
June	5,185	12,529	17,654
July	5,227	9,626	15,025
Aug.	5,925	8,067	16,477
Sept.	8,905	9,113	22,492
Oct.	9,021	11,606	25,204
Nov.	....	10,105	19,724
Dec.	....	6,908	16,798
Totals	....	154,464	202,143

American Home Laundry Mfrs. Assn.

ness Survey Committee of the National Association of Purchasing Agents. Ninety per cent of the PAs see continued improvement in business, though most qualify their predictions by sizing down gains. Only 4 per cent expect a decline from present levels.

Signs of the Times . . .

Of those expecting better business, 39 per cent figure their forecast will hold good for the whole year. Indications that major adjustments have been made and industry's new products and sales plans are two reasons for optimism.

Other signs of continuing business gains: New orders are rising and even have managed to spurt ahead of climbing production. This is particularly impressive near the end of the year when many firms normally cut orders in preparation for inventory taking.

Inventories are pretty well down, and any small build-up that is taking place is closely tied to requirements. Strict inventory control is looked for in 1955. Short lead-time buying is still the rule, but some PAs are taking a little longer buying view. Most supplies are available on short notice.

Boom Rebounds . . .

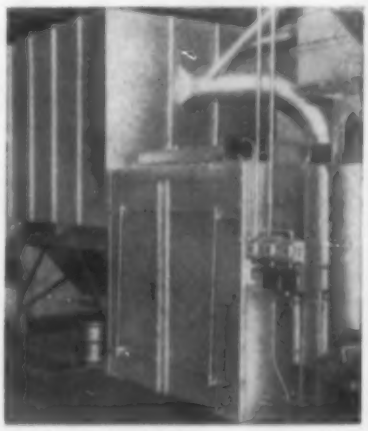
Construction rounded out a boom year in good fashion with a final week that saw awards for heavy construction shoot up to $346 million, best since August.

State and municipal contracts, expected to be a big factor in continuing high construction activity this year, accounted for most of the rise. Highway contracts were highest since September, according to *Engineering News-Record.*

Trends Fore and Aft . . .

Paralleling the general construction trend, November bookings of fabricated structural steel were up some 40,000 tons from the same month last year . . . Rising employment and increased consumer spending are forecast by Harlow H. Curtice, president of General Motors Corp. And, he says, capital spending by industry will stay at record levels . . . The Metal Treating Institute says its yardstick of industry billings in November was up 2.6 per cent from October . . . The new order index of American Supply & Machinery Manufacturers' Association Inc. was 107.26 per cent of the October, 1954, figure.

"Tailor-Made"
TO YOUR REQUIREMENTS
MACLEOD
BLAST CLEANING ROOMS



Modern Macleod Blast Cleaning Rooms—designed with the skill and know-how of more than half a century's manufacturing experience—are "tailor-made" to suit the desires of their users. That's why, whatever your specifications or requirements, you can be sure that a Macleod Blast Cleaning Room will fill your needs to your complete satisfaction.

For use with these rooms, Macleod offers a wide selection of Dust Arresters—in both the screen and filter-tube types. They may be used either as an adjacent (as illustrated above) or outside building installation.

BLAST CLEANING CABINETS

Shown at right is the versatile, new type AL "Rapid-Blast", specifically designed for high rates of continuous production, and especially adaptable to internal cleaning of work. Macleod offers several standard Blast Cleaning Cabinets, such as the "Rapid-Blast," but our Engineering Department will be happy to work with you in designing a special cabinet should your particular requirements demand it.

BLAST CLEANING MACHINES

The Macleod Type "H" Blast Cleaning Machine (at left), is available in both portable and stationary models. Along with low cost operation, it features low initial cost and superior blasting efficiency. Macleod offers an extensive line of Blast Cleaning Machines—portable and stationary, for floor level or pit installation, and in semi-automatic and fully-automatic, continuous cycle models.

58 YEARS of SERVICE TO INDUSTRY

The MACLEOD COMPANY
33 Mostoller Road, Sharonville, Ohio
Send this coupon for MACLEOD Bulletins:
☐ No. 600 Rooms ☐ No. 300-A Cabinets
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Name _____
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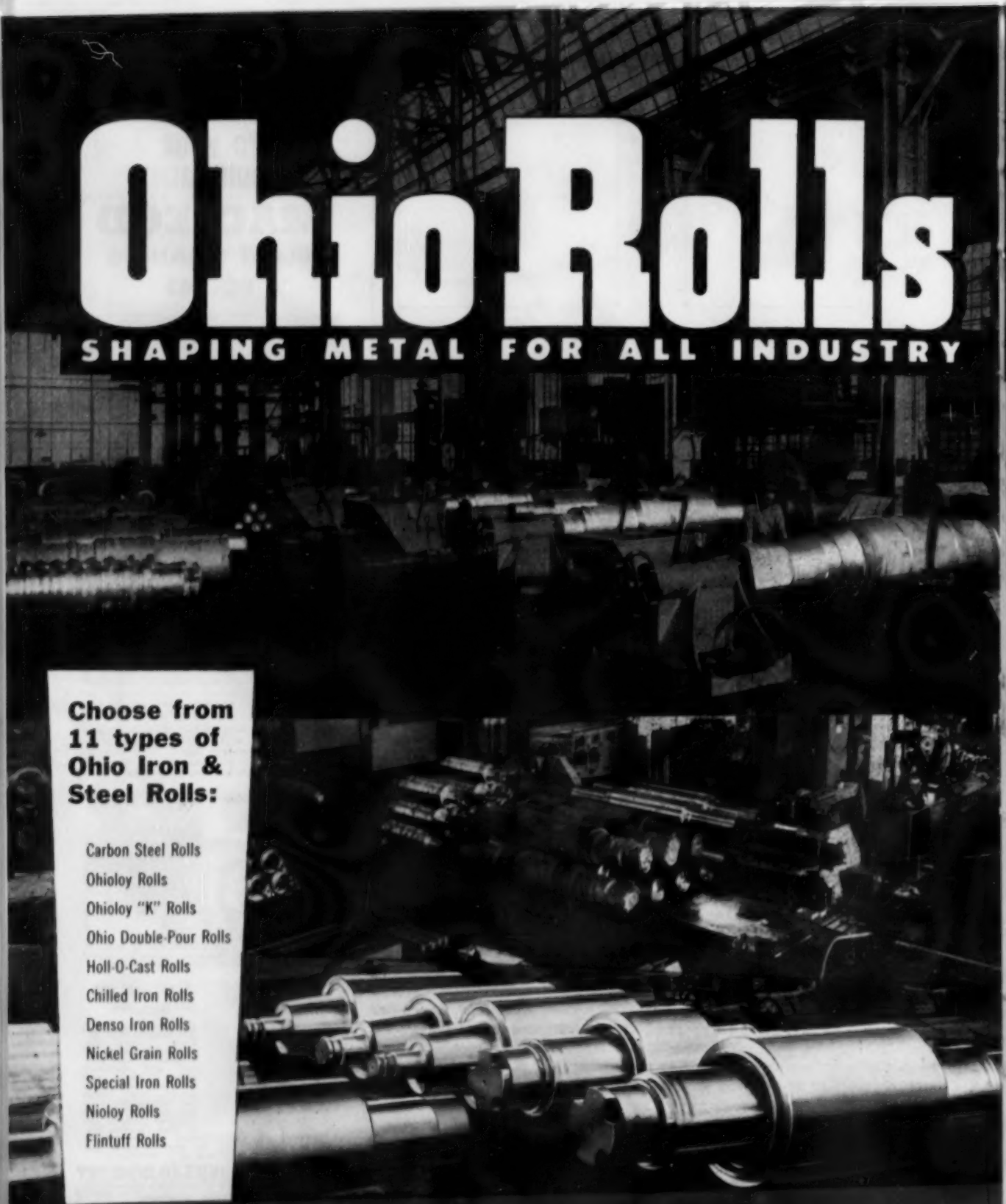
Ohio Rolls

SHAPING METAL FOR ALL INDUSTRY



Choose from 11 types of Ohio Iron & Steel Rolls:

- Carbon Steel Rolls
- Ohioloy Rolls
- Ohioloy "K" Rolls
- Ohio Double-Pour Rolls
- Holl-O-Cast Rolls
- Chilled Iron Rolls
- Denso Iron Rolls
- Nickel Grain Rolls
- Special Iron Rolls
- Nioloy Rolls
- Flintuff Rolls

THE OHIO STEEL FOUNDRY CO.

LIMA, OHIO • PLANTS AT LIMA AND SPRINGFIELD, OHIO

ELMER A. SCHWARTZ
. . . heads Northeastern Steel Corp.

M. R. MINNICK
. . . American Welding & Mfg. v. p.-sales

JOHN A. McDERMOTT
. . . Crobalt gen. sales mgr.

Elmer A. Schwartz, vice president, Great Lakes Steel Corp., was named president of **Northeastern Steel Corp.,** Bridgeport, Conn., recently organized to acquire and operate hot-rolled strip facilities at the Stanley Works. Mr. Schwartz was president of Portsmouth Steel Co.

General Electric Co., Schenectady, N. Y., elected as vice presidents **Francis K. McCune,** general manager of the atomic products division; **Robert L. Gibson,** general manager, chemical and metallurgical division; and **Willard H. Sahloff,** general manager, small appliance division.

Nelson F. Bump was elected vice president-manufacturing and engineering, **Hohl Machine & Conveyor Co. Inc.,** Buffalo. He formerly was chief engineer at Caro Co.

Jeffrey Mfg. Co., Columbus, O., appointed **Harold R. Warsmith** general superintendent of productive divisions; **Charles S. Thomas,** manager of the manufacturing engineering division; **J. J. Kubbs,** chief metallurgist; and **Archer B. Jones,** manager of the tool engineering department.

Alan G. Grey was appointed manager of structural and bar sales for **Kaiser Steel Corp.,** Oakland, Calif.

M. R. Minnick was appointed to the newly created position of vice president-sales, **American Welding & Mfg. Co.,** Warren, O. He was general manager of sales.

Edwin O. Burgham, vice president-operations, was elected president of **Weirton Steel Co.,** Weirton, W. Va. He succeeds **Thomas E. Millsop,** who became president of National Steel Corp., parent organization, last April, and who also is vice chairman of Weirton. **Charles E. Carr,** former assistant general superintendent of Weirton Steel works, succeeds Mr. Burgham as vice president of operations.

C. A. Norgren Co., Englewood, Colo., promoted **C. Neil Norgren** to a newly created post of executive vice president. **Delbert G. Faust** fills another new position in the firm as vice president in charge of sales and advertising. **Leigh H. Norgren** becomes vice president-engineering and production, and **J. A. Wilson** was made chief engineer.

Herbert Kunzel was elected executive vice president, **Solar Aircraft Co.,** San Diego, Calif.

Andrew R. Wardrop was made general manager of **Ford Motor Co.'s** Dearborn General Mfg. Division, Dearborn, Mich. He formerly was assistant general manager of Ford's metal stamping division.

Crobalt Inc., Ann Arbor, Mich., appointed **John A. McDermott** general sales manager. He has been with the firm as a sales engineer for the last six years.

L. E. Simon was promoted from chief metallurgist to chief process engineer of **Electro-Motive Division,** General Motors Corp., La Grange, Ill. He succeeds **W. F. Martin,** who transferred to the Euclid Division's Clinton road plant at Cleveland as manufacturing manager.

R. B. Crean was elected president, **Reflectal Corp.,** a subsidiary of Borg-Warner Corp., Chicago. He also is vice president and assistant general manager of three Borg-Warner divisions. In his new post he succeeds **R. S. Ingersoll,** who now devotes full time as administrative vice president of Borg-Warner.

Jules W. Lederer was elected president, **Autopoint Co.,** Chicago, a division of Cory Corp. He was vice president and sales director at National Presto Industries.

William C. Heard was made domestic sales manager, **Capewell Mfg. Co.,** Hartford, Conn.

McClure Kelley, president of **Austin-Western Co.,** a subsidiary of **Baldwin-Lima-Hamilton Corp.,** Eddystone, Pa., was appointed execu-

JOHN C. MOLINAR

JAMES D. ALLAN

. . . Niles-Bement-Pond executive positions

tive vice president of the parent firm. He is succeeded as president of Austin-Western by **Ralph K. Stiles.**

John C. Molinar was elected vice president, **Niles-Bement-Pond Co.,** West Hartford, Conn. He is responsible for sales activities of the company, both domestic and foreign, and will also direct activities of the advertising and market research departments. **James D. Allan,** manager of domestic machinery sales of Pratt & Whitney Division, will direct the machinery sales of all divisions of N-B-P.

R. C. Ochs was made assistant general manager, axle division, **Eaton Mfg. Co.,** Cleveland.

Bohn Aluminum & Brass Corp., Detroit, elected **T. W. Kuhn** executive vice president. He has been with the organization for 26 years and since 1949 has been vice president-sales. **C. M. Adams** was elected vice president.

R. L. Allshouse was elected a vice president in charge of foreign and flat product sales of **Aetna-Standard Engineering Co.,** Pittsburgh.

E. Hugh Jones was made operations manager and **Richard A. Lodge** was made assistant sales manager in charge of sales at the Lima and Fostoria, O., plants of **Ex-Cell-O Corp.** They will have headquarters at Lima, O.

Clinton B. Fleming was made chief industrial engineer, **Laclede-Christy Division,** H. K. Porter Co. Inc., at St. Louis.

J. G. Mitchell was elected vice president - manufacturing, railway car equipment, **Canadian Car & Foundry Co. Ltd.,** Montreal, Que. **G. L. McMillin** was elected assistant vice president-steel foundry operations at the Longue Pointe plant. Mr. McMillin was formerly works manager at the Granite City, Ill., plant of General Steel Castings Corp.

Walther H. Feldmann, vice president - sales, **Worthington Corp.,** Harrison, N. J., was elected executive vice president. He succeeds **Edwin J. Schwanhausser,** recently elected president. **Thomas J. Kehane,** assistant vice president-general sales manager, succeeds Mr. Feldmann as sales vice president. **Charles A. Butcher** was named vice president for planning.

Charles M. Rappolt was elected president and general manager, **Columbia Metal Box Co.,** New York. He formerly was with Aluminum Co. of America.

Paul L. Bruhn was appointed acting works manager of Republic Steel Corp.'s **Berger Mfg. Division** at Canton, O. **E. T. Causer,** works manager since 1936, continues with Republic in a consulting capacity.

Robert A. Stranahan Jr. was elected president, **Champion Spark Plug Co.,** Toledo, O., succeeding his father, **R. A. Stranahan Sr.,** named chairman of the board. **Frank D. Stranahan** resigned as vice president-treasurer, and was elected co-chairman of the board.

Verne C. Kennedy Jr. was elected vice president, **Streeter-Amet Co.,** Chicago. He was formerly director of sales and engineering.

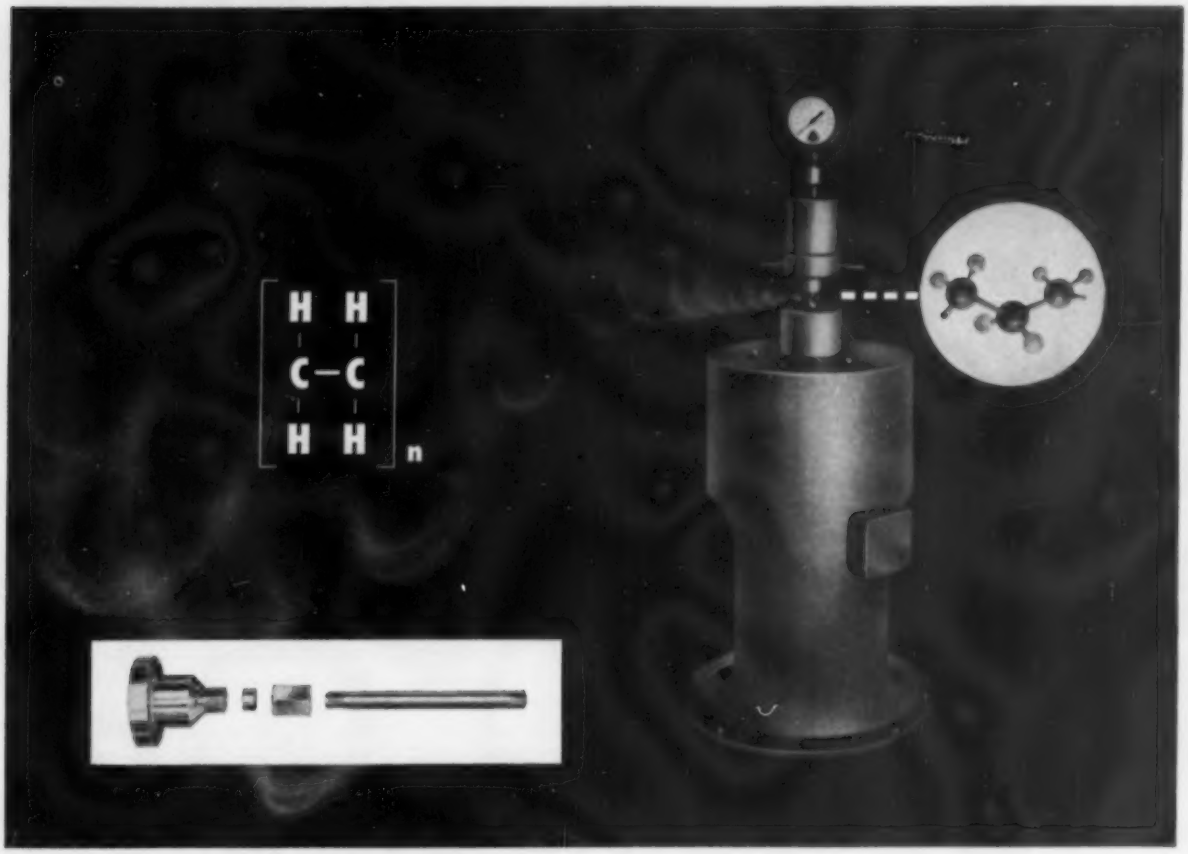
John E. Fahlman fills the newly created position of executive vice president at **Permold Co.,** Medina, O. He retains the office of assistant secretary.

Edward W. Sparkes was made

WALTHER H. FELDMANN

THOMAS J. KEHANE

. . . executive promotions at Worthington Corp.



TUBING BY SUPERIOR SAVES 33%
on production cost of Autoclave covers!

Shown here is the Magne Dash* autoclave, a "dash pot" used to test physical and chemical properties of materials under high pressures.

The Magne Dash cover now costs far less to make than it used to. For in redesigning it, Autoclave Engineers, Inc., Erie, Pa. found that Superior cold drawn Type 316 stainless steel tubular component gave them amazing economies. Savings 33%.

Originally, 2" stainless steel forgings were used in the Magne Dash cover. These had to be machined and deep drilled—time-and-money consuming operations. Superior tubing eliminated this expensive work and reduced scrap loss almost to zero! At the same time, minimum yield strength was raised from about 40,000 psi to 100,000 psi. And Autoclave Engineers found Superior tubing easy to thread, easy to clean and unusually resistant to corrosive catalysts used in testing.

If you have a problem in high pressure processing—or any other problem that involves tubing—call on Superior. We make a specialty of fine tubing—in special shapes and sizes—and in more than 55 analyses! Out of our long experience, you are sure to get the answers you want. Tell us about your current production problem. Send for our free Catalog Section 20 on stainless steel tubing. Superior Tube Company, 2005 Germantown Ave., Norristown, Pennsylvania.

*Licensed by Standard Oil Company (Indiana) U.S. Patents 2631091 and 2661938

Round and shaped tubing available in Carbon, Alloy and Stainless Steels; Nickel and Nickel Alloys; Beryllium Copper; Titanium; Zirconium

Superior Tube

The big name in small tubing

All analyses .010" to ½" O.D. Certain analyses in light walls up to 2½" O.D.

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E. FORREST BAKER
. . . officer at Kaiser Alum.'s forging plant

STANLEY M. RUMBOUGH JR.
. . . resumes executive post at White Metal

DOUGLAS C. ALBRIGHT
. . . manufacturing dir. at Coleman

acting manager of **Crucible Steel Co. of America's** Syracuse, N. Y., area sales branch.

E. Forrest Baker was appointed product manager in charge of the sales program for forgings produced at **Kaiser Aluminum & Chemical Corp.'s** newly acquired aluminum forging plant at Erie, Pa. **Jack H. Coates** was made assistant to the product manager. Both men will be headquartered in Chicago.

Neill S. Brown was named general manufacturing manager-body and assembly group, **Studebaker-Packard Corp.**, Detroit. **Earl M. Douglas** was made general manufacturing manager-foundry, engine and transmission group.

Edgar W. Douglass was named Chicago district manager, building products division, **Steelcraft Mfg. Co.**, Rossmoyne, O.

Dr. R. H. Lueck, general manager in charge of **American Can Co.'s** research and technical department, New York, was elected vice president in charge of the department.

Stanley M. Rumbough Jr. has resigned as special assistant in the White House and has returned to **White Metal Mfg. Co.**, Hoboken, N. J., as vice president. He had been director of sales and secretary. He also returns to his position as president of **Metal Container Corp.**, Indianapolis.

Robert P. Gehring was made sales manager, **Cayuga Machine & Fabricating Co. Inc.**, Depew, N. Y. He was with Westinghouse Electric Corp. for 14 years.

Louis W. Brohman was appointed chief engineer of **Renois Tying Machines Inc.**, Melrose Park, Ill. He was formerly employed in a similar capacity by Gerrard Steel Strapping Division, U. S. Steel Corp.

James H. Wolcott was promoted to western sales manager, **Reed-Prentice Corp.**, affiliate of Package Machinery Co. He has headquarters at Chicago.

Carl T. Bronson was elected vice president - treasurer, **Acme Products Inc.**, Ventura, Calif.

Douglas C. Albright was made director of manufacturing and **Donald W. Coulson**, superintendent of Coleman Co. Inc. Mr. Albright is in charge of plants in Wichita, Kan., La Porte, Ind., and Toronto, Canada. Mr. Coulson is responsible to Mr. Albright for Wichita plant operations. Additional duties were assigned **John Schul**, recently promoted from general purchasing agent to director of material.

Crucible Steel Co. of America, Pittsburgh, appointed **Albert C. Redding** as technical and development engineer to the central operating staff. He will assist in developing programs to increase the firm's over-all operating efficiency. He formerly was production manager of Kidd Drawn Steel Co.

A. G. Neese, former Chicago district sales manager, was made manager of stainless and alloy sales, **Sharon Steel Corp.**, with headquarters in Sharon, Pa. **T. H. McBain** succeeds Mr. Neese at Chicago and is replaced by **W. C. Beck** in the New York district.

OBITUARIES . . .

Glenn C. Wilhide, 58, chief engineer, **Black & Decker Mfg. Co.**, Towson, Md., died of a heart attack Dec. 15.

Harry O. Schuessler, 60, vice president, general manager and a part owner of **Apollo Metal Works Inc.**, Chicago, died Dec. 22.

Marshall J. Douglas, 74, former president, **Douglas Steel Co.**, San Diego, Calif., died Dec. 21.

William W. Vosper, 79, founder, **Toledo Pipe Threading Machine Co.**, Toledo, O., died Dec. 17. He served as board chairman for the last ten years.

Duncan W. Fraser, 79, who retired early this year as board chairman of **American Locomotive Co.**, New York, died Dec. 20. He had been with Alco 56 years.

round the clock with

CF&I-WICKWIRE WIRE

Let's take a look at a typical day in the life of John Q. Citizen—and of the part CF&I-Wickwire Wire plays in his every-day activities.

7:00 A.M.—BEDROOM. John's day starts with the ringing of his alarm clock. There's wire in the mattress and bedspring. In the lampshades and drapery hooks. Bobby pins, safety and common pins in his wife's dressing table—to mention just a few.

7:15 A.M.—NURSERY. Here's the crib from which young John helps the alarm clock to rouse his dad. No less than nine different kinds of wire go into its making. His toys and his tricycle, too—even the zippers on his clothes make use of CF&I-Wickwire Wire.

7:30 A.M.—KITCHEN. Let's inspect the kitchen. In the range and the refrigerator there are wire racks. The kitchen utensils, wire strainers, electric mixer, the egg slicer, the toaster, and dozens of other appliances all use CF&I-Wickwire Wire in their construction.

FOR THE WIRE YOU REQUIRE CHECK CF&I-WICKWIRE

Watch for the balance of John's day in succeeding advertisements that take him to his office, through his plant and finally home to his living room.

CF&I-WICKWIRE WIRE

2846

THE COLORADO FUEL AND IRON CORPORATION

WICKWIRE SPENCER STEEL DIVISION—Atlanta · Boston · Buffalo · Chicago · Detroit · New Orleans · New York · Philadelphia · THE COLORADO FUEL AND IRON CORPORATION—Albuquerque · Amarillo · Billings · Boise · Butte · Denver · El Paso · Ft. Worth · Houston · Lincoln (Neb.) · Los Angeles · Oakland · Oklahoma City · Phoenix · Portland · Pueblo · Salt Lake City · San Francisco · Seattle · Spokane · Wichita

Armco Plans Two Plants

Fabricating facilities in Kansas and Wisconsin to make corrugated metal pipe

ARMCO DRAINAGE & METAL PRODUCTS INC., a subsidiary of Armco Steel Corp., Middletown, O., plans to build a $300,000 fabricating plant at Topeka, Kans., and another plant at Portage, Wis.

The Topeka plant will replace the present one there and double the company's production of corrugated metal pipe in the Kansas-Missouri area. Construction will start immediately.

Manufacturing operations will begin about Apr. 1. After the new plant gets into operation, both of the firm's Topeka plants may be operated simultaneously for a time, says S. R. Ives, president of the Armco Steel Corp. subsidiary.

Products—The plant will turn out corrugated metal pipe and pipe arch—both plain galvanized and asphalt paved and coated—and special fittings, water gaging stations and other steel products for the construction industry.

Stocks of pipe, sheet piling and guard rail will be warehoused at the plant.

W. W. Mains, vice president and division manager, is in charge of all Armco Drainage & Metal Products activities in Kansas and Missouri, with headquarters in Topeka. A. J. Mistler is division sales manager. Robert Schilling will continue as plant superintendent. N. Rozema, division construction manager, is in charge of the project.

Construction of the fabricating plant at Portage has started and is part of a substantial expansion of production facilities and sales organization in the Wisconsin-Upper Michigan area. The new plant will produce corrugated metal pipe and pipe arch and is expected to go into operation early this year. Complete stocks of other fabricated products of the company will be warehoused at the Portage plant, including guard rail, sheet piling, pipe piling, water control gates and subdrainage pipe.

The company's Wisconsin area activities are under the direction of K. C. Thomas, vice president and manager of the Great Lakes Division. Sales efforts are guided by G. R. Betts, division sales manager. The expanding Wisconsin sales organization will be headed by A. T. Rodger Jr., with headquarters at Madison.

Equipment Makers Merge

Dorr Co., Stamford, Conn., and Oliver United Filters Inc., Oakland, Calif., merged under the name of Dorr-Oliver Inc. with headquarters at Stamford.

Ludlow Valve Buys Firm

Ludlow Valve Mfg. Co., Troy, N. Y., purchased Rensselaer Valve Co., Cohoes, N. Y. The Cohoes plant will be shut down and production will be transferred to Troy.

Toolmaker To Market Tractor

Baird Machine Co., Stratford, Conn., builder of high production machine tools, has taken over the marketing of the Beaver riding tractor, a four-wheel farm and garden tractor unit. The tractor has been manufactured by Baird but has been marketed by Beaver Tractor Co., also of Stratford, which has ceased operations. Baird is expanding manufacturing facilities.

Cushioned in Rubber

This rubber bearing, shown assembled in B. F. Goodrich Co.'s Akron plant, is one of 16 being installed on *U.S. S. Forrestal*. The bearings, encased in bronze shells, weigh as much as 8 tons each, measure 10 feet in length, nearly 3 feet in diameter

Buffalo Tool To Boost Output

Buffalo Tool & Die Mfg. Co., Buffalo, plans an 80-per-cent increase in production of dies for the automotive industry in 1955.

Wolverine Tube Opens Depot

Calumet & Hecla Inc.'s Wolverine Tube Division opened a mill depot in Miami, Fla. It will stock Wolverine seamless nonferrous copper water, automotive and refrigeration tube.

Toolmaker Builds Plant

Falco Machine & Tool Co., Los Angeles, is constructing a plant in Gardena, Calif., for manufacture of tools, dies, jigs and fixtures. Completion is scheduled for this month.

Wayne Crane Division Renamed

American Steel Dredge Co. Inc., Ft. Wayne, Ind., changed the name of its Wayne Crane Division to Wayne Shovel & Crane Division. This division makes crane-excavators and industrial yard cranes.

Bristol Co. Expands Plant

Bristol Co., Waterbury, Conn., is expanding its manufacturing plant, has increased its heat-treating facilities and has enlarged its office space. The company's main products are instruments and screws.

Printed Circuits Inc. Formed

A new company, Printed Circuits Inc., 36 Tunxis Ave., Bloomfield, Conn., has been formed for the design, engineering and manufacture of all types of printed circuit boards. C. T. Mitchell is general manager of production and engineering. Complete production facilities, including art work, photography and plating, as well as design and fabricating, will be in operation this month. Officers of the firm include E. E. Carpenter, president; A. H. Kruth, treasurer; and Judge M. J. Cutler, secretary.

Warnock and Hersey Merge

Charles Warnock & Co. Ltd. and Hersey Laboratories Ltd. have merged under the name of Warnock Hersey Co. Ltd. Head office and laboratory have been opened in Montreal, Que., and a branch office and laboratory in Edmonton, Alta. The new company is one of the largest inspection, appraisal and testing companies in Canada. The company has entered into the new fields of nondestructive testing by the use of x-ray and ultrasonic devices.

Opens Refractories Warehouse

Mexico Refractories Co., Mexico, Mo., established complete warehouse facilities at 2431 E. Marginal Way, Seattle. Bob M. Robertson is the firm's Seattle representative.

Cleveland Crane Builds

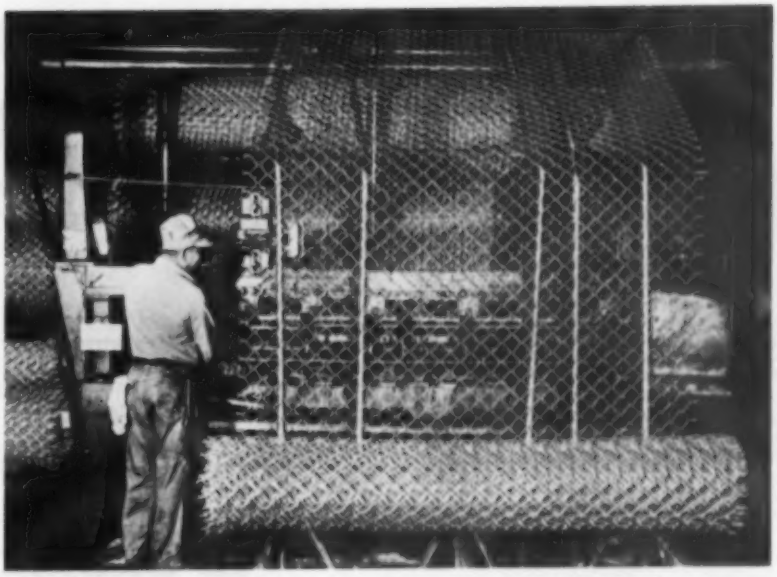
Cleveland Crane & Engineering Co., Wickliffe, O., is erecting a plant at 6435 Corvette St., Los Angeles, to house office, warehouse and manufacturing facilities. The building will be occupied jointly by Cleveland Crane and General Conveyor Inc., California distributor of the former's overhead materials handling equipment.

Forms Toolmaking Firm

Progressive Industries Inc. has been organized in Toledo, O., by Clarence Simon, president, and Edwin Herroon, vice president. The firm will make tools, dies, jigs and fixtures at a new plant in East Toledo, O. Both men formerly were associated with Midwest Stamping & Mfg. Co., Bowling Green, O.

Borg-Warner Forms Division

Borg - Warner Corp.'s newly formed Ingersoll Conditioned Air Division, Chicago, plans a major expansion of operations in the heating and air conditioning industries. J. H. Ingersoll is president and general manager of this division; R. B. Crean, vice president and assistant general manager. F. S. Gombert, as manager, is directly responsible for the divisional operations. The division's plant is in Kalamazoo, Mich.



Aluminized Wires Mesh Tightly Into Many Markets

Survey by American Chain & Cable Co.'s Page Steel & Wire Division indicates a broad market for aluminized wires. Large scale production, planned for 1955, is expected to make the price competitive. Markets for chain link fence, shown being woven at the firm's Monessen, Pa., plant, are particularly impressive

Ford Plans Expansion

Ford Motor Co., Dearborn, Mich., is developing plans for a new manufacturing plant to be built at Mound road and 17 Mile road in Sterling township north of Detroit. The plant will produce chassis parts. The firm's Aircraft Engine Division, Chicago, will construct four additional jet test cells, to cost more than $1.5 million.

Equipment Firm Buys Adams

LeTourneau-Westinghouse Co., Peoria, Ill., is purchasing the plant and assets of J. D. Adams Mfg. Co., Indianapolis, manufacturer of road-building and earthmoving equipment. The purchase is subject to approval by Adams company stockholders. LeTourneau - Westinghouse is a subsidiary of Westinghouse Air Brake Co., Wilmerding, Pa. Adams products will continue to be produced in Indianapolis and Canada.

Howard R. Meeker, now president of Adams, will be chairman of the board of LeTourneau-Westinghouse Co. Merle Yontz continues as president. Floyd D. Wallace, vice president of Adams, will become a vice president and director of LeTourneau-Westinghouse and will be general manager in charge of manufacturing operations in Indianapolis.

Duo-Therm Enters New Field

Motor Wheel Corp.'s Duo-Therm Division, Lansing, Mich., has entered the power lawn mower field. Production of rotary and reel power lawn mowers will be integrated with manufacture of Duo-Therm's line of appliances, including space heaters, gas floor furnaces, oil furnaces, gas-fired incinerators, water heaters and trailer air-conditioners.

Preco Buys Two Firms

Preco Inc., Los Angeles, manufacturer of motor products and air circulating fans, purchased Electra Motors Inc. and California Gear Co., both of Anaheim, Calif.

Sterling Abrasives Renamed

The name of Sterling Abrasives Division of Cleveland Quarries Co., Cleveland, was changed to Sterling

(*Please turn to page* 58)

It's Cast Iron

Republic Pig Iron used in developing porcelain cast iron cookware only 1/10" thick

with a FEATHERWEIGHT feel!

The finished castings for this new product have a uniform, tight grain with a good enameling surface. In fact, the manufacturer, Prizer-Painter Stove Works, Inc., of Reading, Pa., is able to apply enamel directly to the cast surface, eliminating the need for a base coat. Prizer-Ware is strong and durable. Yet, it is only one-tenth of an inch thick.

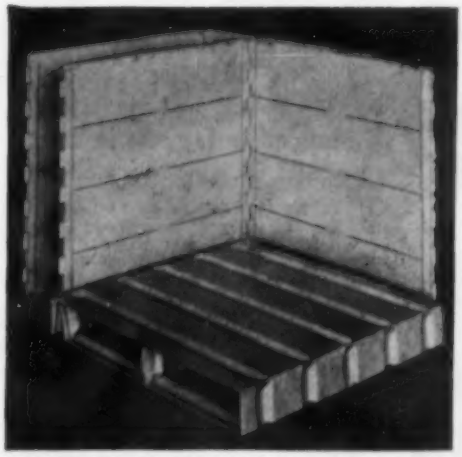
Casting requirements called for an extremely fluid, clean pig iron with no porosity. A Republic pig iron metallurgist was called in to work with Prizer personnel. He recommended the proper grade of pig iron without hesitation or prejudice—because Republic is the only producer of all grades of merchant pig iron.

Close cooperation between customer and the Republic pig iron metallurgist is not unusual. Why not make it a practice to call him in whenever you need help? There is no cost or obligation.

You can handle heavy castings easily with Republic Chain Slings. Fabricated from Republic Alloy Steels, their high strength—low weight ratio—provides an exceptionally high degree of safety. Republic Chain Slings are made in any length to meet your requirements. All are proof tested and warranted to meet or exceed specifications.

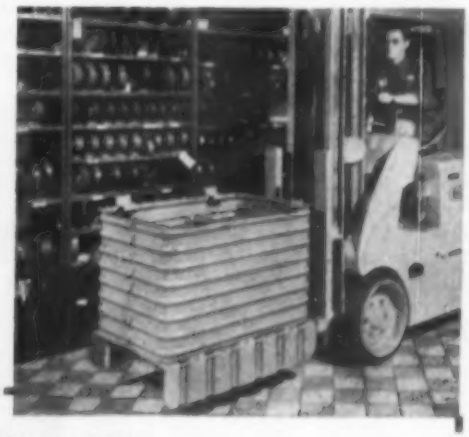
REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products



Collaps-a-tainer, the steel box that folds flat, can reduce your cost of interplant shipping. Have your traffic manager figure your cost of returning empty containers. Then compare with savings possible from using the Collaps-a-tainer. Four collapsed units ship in the space of one open unit. It's easy to assemble, lightweight, strong and durable and easy to knock down. Collaps-a-tainer can also be used on the production line or as a storage bin. It stacks to any practical height. Standard size, 30" x 30" x 30", weighs approximately 100 pounds.

To help improve foundry efficiency and economy during molding, moving, storing and shipping operations, Republic makes a complete line of steel boxes, skids, pallets and flasks. They are built to your specific requirements. Republic Pallet Racks and Steel Shelving provide additional space-saving economy—help simplify your handling problems.



REPUBLIC STEEL CORPORATION
3120 East 45th Street • Cleveland 27, Ohio

Please send me literature on:

☐ Chain Slings ☐ Boxes, Skids, Pallets ☐ Collaps-A-Tainer
☐ Pallet Racks, Shelving ☐ Have a Pig Iron Metallurgist Call.

Name_____ Title_____

Company _____

Address _____

City_____ Zone____ State_____

REPUBLIC STEEL

(*Concluded from page 55*)

Grinding Wheel Co., Tiffin, O., and is being operated as a wholly owned subsidiary of Abrasive & Metal Products Co., Detroit.

Bendix Renames Foundry

Bendix Aviation Corp., Detroit, changed the name of its Eclipse-Pioneer Foundries Division to Bendix Foundries. It supplies precision aluminum and magnesium castings, using sand, die, plaster, shell-mold and permanent-mold processes.

Steel Processing Plant Opened

Wall Colmonoy Corp., Detroit, opened a stainless steel processing plant in Morrisville, Pa. It will be operated as a branch of the firm's Stainless Processing Division, with John Kozelski acting as general plant manager. The plant will provide contract brazing and heat-treating facilities for stainless steel alloys and aircraft components.

Electronics Firm Renamed

Technical Industries Inc., manufacturer of electronic products, changed its name to Airquipment Co. Offices are maintained at 2248 E. 47th St., Los Angeles.

Los Angeles Firm Sells Units

United States Spring & Bumper Co., Los Angeles, sold its Chainveyor Division to Chainveyor Corp. and its Brake Division to Silver Line Brake Lining Corp. The purchasing corporations consist essentially of the former staff and operating personnel of the divisions and have established headquarters at 5618 E. Washington Blvd., Los Angeles.

Officers of Chainveyor, producer of overhead conveyors, are P. T. Rauen, president; L. F. Working, vice president and general manager; and A. E. Arnold, secretary-treasurer. C. L. Long remains in charge of production. Eastern production facilities are contemplated.

Officers of Silver Line Brake Lining Corp. are P. T. Rauen, president; S. A. Smith, vice president-sales; and J. N. Rauen, general manager. L. G. Hall continues as plant manager of the manufacturing plant at Santa Clara, Calif.

Lear Builds West Coast Plant

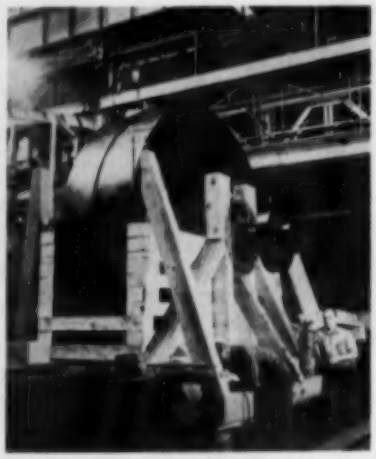
Lear Inc., Grand Rapids, Mich., is constructing a 69,000-sq-ft plant in Santa Monica, Calif., for housing heat-treating, plating and other new production equipment. The company makes radios and radio and aircraft accessories.

Bath Iron Announces Merger

Pennsylvania Crusher Co., Philadelphia, a wholly owned subsidiary of Bath Iron Works Corp., Bath, Me., merged with the parent company and now operates as the Pennsylvania Crusher Division.

Screw Firm Expanding Plant

Production will begin early in 1955 in the new building of Southern Screw Co., Statesville, N. C. The new plant, first unit in a $2-million expansion project, will almost double the company's space. The firm plans to add dowel and lag screws to its present production of stove bolts, machine screws, drive screws, A & B tapping screws, carriage bolts, hanger bolts and an extensive line of wood screws. Under its new program, Southern Screw will have its own plating facilities.



No Rock in This Cradle

"Wrapping up" big marine propulsion equipment is an art. Above, a gear at GE's Lynn, Mass., plant is being "chocked and blocked" in a shipping cradle. Some of the cradle's steel bracing must be welded into position

MonoRail Buys Columbus Firm

American MonoRail Co., Cleveland, purchased Landahl Conveyor Co., Columbus, O., and will operate the property as a subsidiary. New officers for Landahl include John L. Pischke, president and Carl Harris, secretary. J. P. Landahl assumes the position of general sales manager. American MonoRail also organized Canadian MonoRail Co. Ltd. as a wholly owned subsidiary at Galt, Ont. Quigg Lohr will serve as general manager and Earl Balke as works manager of the Canadian property.

Bell Aircraft Buys Firm

Bell Aircraft Corp., Buffalo, acquired Hydraulic Research & Mfg. Co., Burbank, Calif., manufacturer of hydraulic valves. Bell will operate the firm as a wholly owned subsidiary.

Pennsy Enlarging Ore Pier

Pennsylvania Railroad awarded Dravo Corp., Pittsburgh, a contract for construction of a third "arm" at its Greenwich Point ore pier in Philadelphia. The unloading machine, capable of handling up to about 25 tons of ore in one bite, will help unload freighters from Canada's Quebec-Labrador, South American and other iron ore mining developments.

Carborundum Expands in West

Carborundum Co., Niagara Falls, N. Y., has completed two new warehouse and office buildings in California and has reorganized sales, engineering and other services in the West into what is now designated the Pacific district.

The Pacific district organization brings together in a co-ordinated program the product sales and engineering services of all divisions of the company—grinding wheels, abrasive grains and powders, sharpening stones, metal additives and other products of the Bonded Products & Grain Division; coated abrasive sheets, rolls, belts, discs and other products manufactured by the Coated Products Division; a full line of super refractory bricks, shapes, cements and porous media of the Refractories Division;

heating elements and resistors produced by the Globar Division; a wide variety of ceramic electric components produced by the Stupakoff Ceramic & Mfg. Division.

The warehouse and office buildings are at 2626 S. Malt Ave., Los Angeles, and at Alviso road and Evelyn avenue, Mountain View, Calif. (near San Francisco). John G. Fritzinger, district manager, has his headquarters in Los Angeles.

REPRESENTATIVES

Parker Appliance Co., Cleveland, appointed Keystone Pipe & Supply Co., Milwaukee, as distributor for its tube and hose fittings and related products. Metropolitan Supply Co., Los Angeles, was appointed as distributor of Parker Hoze-lok fittings and hydraulic hose assemblies.

Penn Precision Products Inc., Reading, Pa., appointed Krusen Wire & Steel Co., Los Angeles, as representative for its strip. Beryllium copper strip will be stocked by Krusen for immediate warehouse delivery.

Kent-Owens Machine Co., Toledo, O., appointed Machinery Sales Co., Los Angeles, as agent for its milling machines.

Brush Electronics Co., Cleveland, appointed the following distributors: H. F. Soderling Co., Seattle; Wepfer Engineering Sales Co., Little Rock, Ark.; D. G. Machinery & Gage Co., Atlanta; and Longdon Sales Co., Greensboro, N. C.

Hydraulic Press Mfg. Co., Mt. Gilead, O., appointed Norman Engineering Co., Chicago, as representative for its Hydraulic Power Division line of products.

Calumet & Hecla Inc.'s **Wolverine Tube Division**, Detroit, appointed A. B. Murray Co., Elizabeth, N. J., as sales agent for condenser and heat exchanger tubes.

Enthone Inc., New Haven, Conn., maker of metal finishing and electroplating chemical products, assigned additional territory to its Chicago manufacturing distributor, Ardco Inc. Through the latter's resident sales engineer, James P. Hendrickson, St. Louis, Ardco will service southern Illinois and eastern Michigan.

Giant's Needlework

THREE immense industrial trucks, normally used to lift and carry loads up to 60,000 lb, are being built for the Atomic Energy Commission by Automatic Transportation Co., Chicago.

The electric-powered units will work within needle-threading tolerances and at tortoise-like speeds of ½-mile per hour. The trucks support a 10-in. thick ram which will work within 1/64-in. tolerances. Gear ratio is more than 2500:1 (a standard auto's gear ratio is 3.5:1), producing a top speed of about 30 fpm.

NEW ADDRESSES

General Conveyors Corp. moved its general offices and plant to 420 E. Ten Mile Rd., Pleasant Ridge, Mich.

Grayson Controls Division of Robertshaw-Fulton Controls Co. moved to its new factory on Long Beach Blvd. at Long Beach Freeway, Long Beach 5, Calif.

Kajon Mfg. Co. moved its plant and offices to 107 N. Eucalyptus Drive, El Segundo, Calif.

Union Carbide & Carbon Corp., New York, consolidated its Cleveland offices in a new building and distributing center at 1300 Lakeside Ave. The headquarters houses all the company's divisions in the Cleveland area, including the Bakelite Co., Carbide & Carbon Chemicals Co., Electro Metallurgical Co., Haynes Stellite Co., Linde Air Products Co. and National Carbon Co.

Federal Pacific Electric Co., Newark, N. J., moved its Houston sales office to the Bermac building. The office is under the supervision of T. Beyert, branch manager in Houston. Houston is part of the central sales region with headquarters in St. Louis under the managership of W. M. Stark.

Samuel G. Keywell Co. moved its offices from 16800 Harper Ave. to 3075 Lonyo Ave., Detroit 9.

H. K. Porter Co. Inc. moved its **Leschen Wire Rope Division's** warehouse and district sales offices in Seattle to 2724 First Ave. S. and in Los Angeles to 6424 E. Fleet St.

N. T. Gates Co., designer and supplier of industrial packaging and preservation materials, moved from Philadelphia to its recently completed building at 6845 Westfield Ave., Camden, N. J.

ASSOCIATIONS

Col. P. L. Houser was elected president of **Metal Cutting Tool Institute**, New York, succeeding Mason Britton who becomes vice chairman. Colonel Houser is general supervisor, manufacturing standards research, International Harvester Co., Chicago. G. F. Holland, president, Union Twist Drill Co., Athol, Mass., was elected chairman of the institute board of directors.

Goodloe H. Rogers was elected president of **Automotive Parts Manufacturers Association**, Detroit. He is president and general manager of American Forging & Socket Co., Pontiac, Mich. Other officers of the Association are: Vice president, Guy S. Peppiatt, president of Federal Mogul Corp., Detroit; and Secretary-Treasurer, J. W. Dixon, vice president of Clevite Corp., Cleveland. Frank Rising is general manager.

American Trade Association Executives officially opened its association building at 1145 19th St. N.W., Washington, and its Association Management Library which contains books and a broad cross-section of documents covering every aspect of association management. Material is circulated on a two-week loan basis.

Ansul

is the only dry chemical fire extinguisher backed by a five year warranty!

Here is proof of Ansul's superiority . . . *a five year equipment warranty*, the only one of its kind in the fire control industry.

For the buyer of fire equipment this important warranty means many *extra* years of trouble-free protection plus freedom from costly and frequent maintenance checks and repairs.

The special design and construction features that make this warranty possible provide not only dependable protection but also *fast, effective* fire control. Ansul's *weather-tight* construction keeps out moisture and resists corrosion. *Patented nozzles* deliver the right kind of stream for your fire protection problem. The *sealed pressure cartridge* puts Ansul's "Plus Fifty" dry chemical to work immediately—no delay or lag. And finally *rugged construction* makes it possible for Ansul equipment to give peak performance under the toughest operating conditions.

HERE IS THE BIG TRAINING AND SERVICE PLUS OFFERED ONLY BY ANSUL!

Available without cost to all Ansul users.

Training for your personnel at your plant by Ansul specialists.

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Visual aids on fire control for your safety meetings and other training.

In-plant survey to scientifically determine your fire protection needs.

Call the Ansul Man!

ANSUL

Get in touch with your local Ansul man through the "yellow pages" or write ANSUL CHEMICAL COMPANY, Fire Equipment Div., Dept. F-133, Marinette, Wisconsin.

STEEL

January 10, 1955

Technical Outlook

ABRASIVE RACE—Behind guarded doors in at least two abrasive-grain makers' plants, research teams are going full tilt on projects which will lead to a brand new abrasive substance. While the nature of the new grains is being kept under wraps, it's certain that work is beyond the idea and paper stage. One of the principals reports that 1955 may well be the year when at least one new grain is announced—perhaps several. Hint is that the new grains will step up grinding efficiency.

GOES COMMERCIAL— General Electric is using irradiated polyethylene plastic tape as turn insulation on circuit breakers. Called Irrathene 201, it is stabilized for continuous use at 220 to 255° F.

HOT SEAT—Guided missile engine designers are on it. With ramjets, afterburners and rockets operating within 200-300° F of melting temperatures of the best high-temperature alloys, their search for high heat strength materials is like trying to find a container for the perfect solvent.

Having to design high-temperature alloys around minimum quantities of critical materials doesn't make their task easier. Cermets and refractory hard metals such as silicides, borides, carbides and nitrides are hope for the future.

NYLON PRESSURE TUBING—Reported cheaper and easier to install than either rubber hose or steel tubing, nylon tubing has a new high-pressure use. Some 90 ft of the ⅛-in. OD tubing feeds grease to 12 lubrication points in the push-button lubrication system offered as optional equipment in the 1955 Lincoln and Mercury automobiles. Supplied by Polymer Corp. of Pennsylvania, the material has a burst strength of 2500 psi, and it's easier and safer to handle on assembly lines. Tests are now under way on a host of other applications, too.

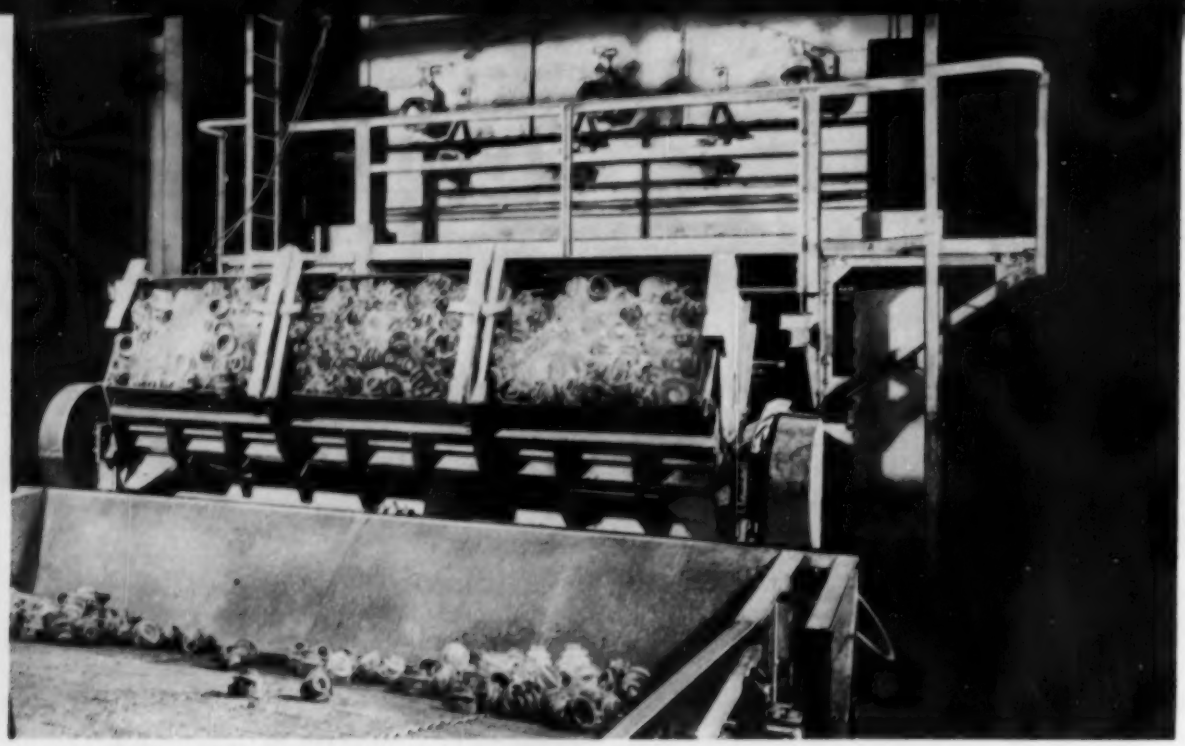
LESS ROLLING WEIGHT—A metal-plywood laminate, used for the walls of a new truck body that handles 15 tons, clips 1000 lb off its weight. The material, Armorply, is 0.025 in. aluminum facing bonded to ¼-in. plywood core with rivets. U. S. Plywood Corp. says rivets give the body flexibility, and it is less susceptible to stresses and strains from expansion and contraction caused by changing weather conditions.

NEW CHECK—ASTM announces a new method for determining sulphur in fuel gases. It's applicable to concentrations between 1.0 and 30 grains per 100 cu ft in natural, manufactured and mixed gases.

GROWING— Vacuum forming is finding an important place in plastics fabrication. A big advantage: Convenient adaptability to multiple production. According to Marblette Corp., a number of dies made from a single master or several different dies can be mounted on the press at one time to use its full capacity and increase hourly output.

PERMANENT PACKAGE— Make the package part of the finished product and save on conventional outside wrappings for moisture and vapor proofing. The Navy is trying it for reducing packaging and preservation costs of shipboard electrical fittings and fixtures.

Metalworking Outlook—p. 19 Market Outlook—p. 93



"The need for a cast material stronger than malleable with properties approaching a good grade steel forging prompted us to develop . . ."

PEARLITIC MALLEABLE:

Castings for Tougher Jobs

By Dr. ALLEN G. GRAY
Technical Editor

THAT'S the way Carl Joseph put it when he told the SAE of pearlitic's progress at General Motors' Central Foundry Division.

Secret of the stronger iron is not only in the control of the melting process. Heat treatment of the castings is more important.

This makes sense because metallurgists know steel is given definite mechanical properties by heating to a certain temperature, quenching or cooling rapidly in oil or water, then reheating and allowing it to cool slowly for tempering.

The Material—It's not new. But foundrymen will tell you that manufacturers are just waking up to what they can do with a cast material having physical properties of steel in the medium carbon range.

More evidence is found in the increasing amounts of pearlitic that malleable foundries are turning out. Several told STEEL that one third of their output is now pearlitic; others said they are up to the 40 to 50 per cent range.

Since end of World War II, pearlitic production increased over 100 per cent and is expected to go up at least another 20 per cent this year. Auto makers say there may be as much as a fourfold increase in use within a short time —much of it in new casting applications.

Similar Start—Beginning product for both malleable and pearlitic malleable is white iron, a mixture of iron carbide and pearlite. When it is heated above the critical range, say 1700°F, a solid solution of austenite is formed. On holding at this temperature carbide decomposes and precipitates graphite out of solution.

This process continues until the austenite contains up to about 0.75 per cent carbon in solution. To make straight malleable iron, the work is cooled at a controlled rate. Remaining carbon dissolved in the austenite is thrown out of solution as graphite. The structure produced is ferrite, with graphite embedded in it.

Pearlitic—There are three possible ways of making it. One is by reheating the malleable iron described above. The temperature used is in the austenite range and some of the carbon is dissolved.

The austenite-carbon mixture is then cooled fast enough so little or no graphitization takes place. This gives a pearlitic matrix. If the cooling is fast enough, a martensitic or bainitic matrix may be formed.

PEARLITIC MALLEABLE
CHECK THESE PROPERTIES FOR YOUR APPLICATIONS

● **Machinability**—Taking SAE 1112 as 100 per cent, here's one expert's rating:

General Motors Pearlitic Malleable class B (tensile and yield same as ASTM grade 48005)—95 per cent; GM class A (tensile yield corresponds at ASTM grade 60003)—80 per cent.

SAE 1022—70 per cent; SAE 1040—60 per cent; standard malleable iron—120 per cent; hard cast iron—50 per cent.

Machining time is saved by coring out hollow sections and by using 2-degree draft angles.

● **Damping**—Good damping characteristics show up in motors using a cast crankshaft where quiet operation is a factor.

● **Bearing Properties**—Good nonseizing properties in metal-to-metal wear. Example: Bronze bushing can be eliminated in automotive rocker arm operating on hardened steel shaft.

● **Machine Finish**—Parts can be machined to a smooth surface and polished to a mirror-like finish, cutting friction and wear to a minimum. This is a valuable property in making heavy duty diesel pistons; also, in crankshafts for refrigerators and small engines.

● **Fatigue and Wear**—Components show good fatigue life. Castings stand up to excessive wear at high speed. Oil quenched and tempered pearlitic (Brinell 255 to 285) is cast for transmission gears.

● **High-yield ratio**—With such properties as a minimum yield strength of 80,000 psi and ultimate strength of 100,000 psi, castings can be used for highly stressed parts. Modulus of elasticity is in the range 26 to 28 million.

Combination high yield strength and good machinability is paying off for parts such as universal joint yokes. One manufacturer uses an oil quenched and tempered casting with a Brinell of 241 to 269. Broach life is 15,000 to 20,000 pieces with a high of 3000 pieces per tool grind and an average of 1600 to 1800 pieces per tool grind.

● **Selective hardening**—Castings can be selectively hardened by the flame or induction method. Rim of a truck trolley wheel in the 197 to 241 Brinell range is hardened to 50 Rc (1/16-inch depth). Teeth of sprocket are flame hardened to Rc 55.

● **Liquid bath hardening** can be used on lower hardness pearlitic malleable by allowing longer time at higher temperature. This gives enough combined carbon to give minimum Rc 50 when oil quenched.

● **Welding**—Pearlitic malleable may be welded to steel if properly controlled. Example: Universal joint yokes are welded to SAE 1020 propeller shaft tubes. Both torque strength and fatigue life are satisfactory.

● **Consolidation**—Castings engineered as a composite of several parts are being looked at by a number of companies. Pearlitic malleable is in forefront of such redesign. No assembly steps, less machining, fewer parts in inventory all spell savings. Often a bonus shows up in better alignment, compactness and absence of vibration in moving parts.

Most Popular—The second method (and the most widely used) is called the arrested heat treating cycle.

The malleable cycle is carried to completion at the usual temperatures, and instead of slow cooling to allow further graphitization, the material is cooled rapidly from the austenitic field to room temperature.

This gives a matrix of about 0.75 per cent carbon with graphite embedded in it. Desired properties are then obtained by tempering like steel. Some graphitization takes place, so the casting is a little lower in combined carbon than the eutectoid value.

A Third Way—It is possible to make pearlitic malleable using the ordinary cycle for regular malleable iron. Certain elements, manganese for example, can be added to white iron to retard graphitization.

At G-M's Central Foundry Div.—The product is originally cast white, which means that all carbon is in the combined state. Castings are heated to 1700°F or higher to eliminate the carbide. This is called the first stage of graphitization. Then the malleablizing (cooling) cycle is interrupted at 1650°F, and the castings are air quenched.

In the second stage, graphitization is stopped at a point which allows sufficient carbon to remain in the casting to definitely affect the properties of the iron. To do this, castings are reheated below the critical and tempered back to desired hardness. Castings requiring higher physical properties are oil quenched and tempered.

Questions—The yield and ultimate strength of pearlitic malleable generally satisfies materials engineers who are used to specifying steels. Sometimes they question the use of a material with specified elongation values of less than 10 per cent and low Charpy impact results.

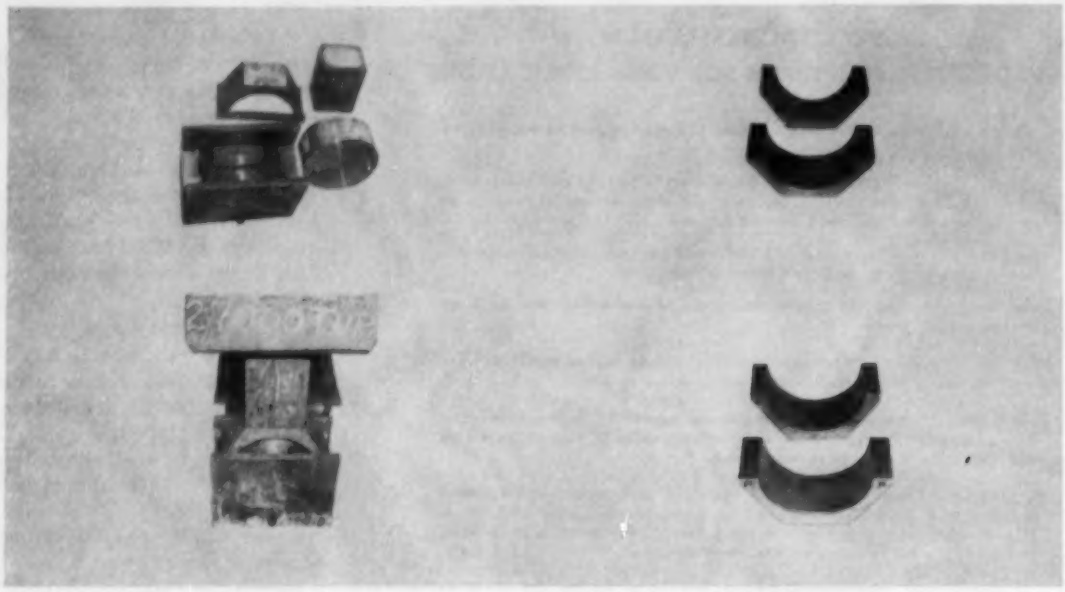
But, if one stops to think, it soon becomes evident that metal in service does not ordinarily withstand large strains. Deformations equivalent to 1 or 2 per cent elongation can be shown sufficient to relieve high stress concentrations. Service failures are seldom accompanied by deformation of more than 5 per cent elongation.

Many alloys used in severe service, as in aircraft, are purchased under specifications calling for 3 to 5 per cent elongation minimum.

Facts—Here's how the whole problem is summed up by Dr. W. K. Bock, Manager of Metallurgical Research, National Malleable & Steel Castings Co., Cleveland. He told STEEL: "We do not feel there is any drawback to using a material with a relatively low elongation specification. In the case of steels, it's the nature of the material to be quite ductile.

In the case of pearlitic malleable, it's the nature of the material not to have high ductility in the tension test. So we specify a ductility which will guarantee proper manufacturing conditions."

TEST I—BRINELLING



(Top) Test fixture and specimen; (bottom) test set-up

Specimen after test—(top) tight fitting; (bottom) loose fitting

PEARLITIC MALLEABLE: A Case History

UNLESS YOU ARE a railroad man, the bearing journal box at the end of each axle on a freight car is just another part. Actually, it's a number one trouble spot—the seat of the old hot box problem.

Timken Roller Bearing Co. produces bearings that go into the journal box to cope with the hot box. For a long time the company made its bearing housings from 1030 steel. They were forged in two halves, welded together, stress relieved and machined.

Engineers at National Malleable & Steel Castings Co., Cleveland, suggested pearlitic malleable for the housing material. The two pieces could be cast as a single part. It didn't take much figuring to show that was a good idea, dollar-wise.

Proof—But the big question was the metallurgical and mechanical properties of pearlitic malleable, compared with 1030 steel. Here's where Timken engineers had to be shown to be sold. After all, a bearing housing must have long life to keep maintenance costs in line, too.

The relatively high yield to tensile strength ratio of pearlitic malleable was desirable. But the question of brinelling or bearing pound-in and that of an elongation lower than 1030 left doubts in Timken's mind.

National Malleable people were prepared to prove their points.

Test No. 1 — First came the question of brinelling. Timken had experience with housings made from gray iron. They pounded in and loosened the cup or adhered to the box. Would pearlitic malleable show the same shortcomings?

A test was set up to simulate impact conditions encountered in service, using 1035 steel for comparison.

Here's How — Test specimens were machined to approximate conditions and bearing areas of the roller bearing journal housing were subjected to repeated vertical impacts.

To check the effect of tight and loose fitting conditions, as outlined by Timken, a set of specimens was prepared to 0.003 in. tightness and a second set to 0.004 in. looseness.

Apparatus—The fixture used to test these specimens under impact was a cylinder, which simulated the roller bearing cups. It was made of mild steel, carburized about 1/16 in. deep and hardened to Rc 62 to 64.

The specimen was loaded in the fixture, and the complete assembly was placed under the 27,000 lb. A. A. R. drop hammer. This is close to the maximum bearing load for the 6 x 11 in. journal.

The Works—Each specimen was given 100 impacts from ¼ in.

height; 100 impacts from ½ in.; 30 from ¾ in.; and 10 from 1 in. Readings taken during tests showed:

Impounding of the roller bearing cup into the bearing housing was 53 per cent less in pearlitic than the 1035 steel under both loose fitting and tight fitting conditions.

Thickness of the bearing housing top distorted 59.2 per cent less in pearlitic than in steel for the loose fitting condition and 60.5 per cent less for the tight fitting condition. There was no evidence of cracks in test specimens.

Test No. 2—Another question was on ductility. There was concern that pearlitic is so brittle it would fracture under impact without yielding or deforming under a load. The reasoning was based on the relatively low elongation figure from standard test bar data.

Timken people insisted that service on freight cars required a minimum of distortion in use. If the material would permit, because of its elongation, a distortion of only a fraction of the possible elongation percentage, the part would be unsatisfactory.

Another point—Of more importance than the elongation is the yield to tensile strength ratio, since the ability to resist permanent set under repeated impacts is essential. The yield strength of pearlitic malleable is about 70 per cent of the ultimate; the problem, then, was to find how it withstands brittle fracture.

Test No. 2 was set up. Two housings were cut through just below the top section. This area, which is in contact with the under side of the frame and carries a big portion of the load, was placed under a 3 million lb hydraulic press. A 3 in. cylinder of steel was placed on the unsupported center section, and increasing pressure was applied to the point of failure.

Breaking loads were over 1,000,000 lb on one piece and more than 750,000 lb on the other. Another important point: Physical deformation of the pearlitic malleable iron was visible before fracture.

Test No. 3—Another test was made on a thinner section, which had a special loading problem. The section was again supported on the edges, but the load was applied through a round bar on the center unsupported portion.

The specimen bent under the load. (see photo) This was more evidence that strength and ductility of the material were all right.

More Saving—Design study by Timken engineers in co-operation with the foundry led to the suggestion that coining the radius of the casting that housed a new bearing design would eliminate costly machining operations.

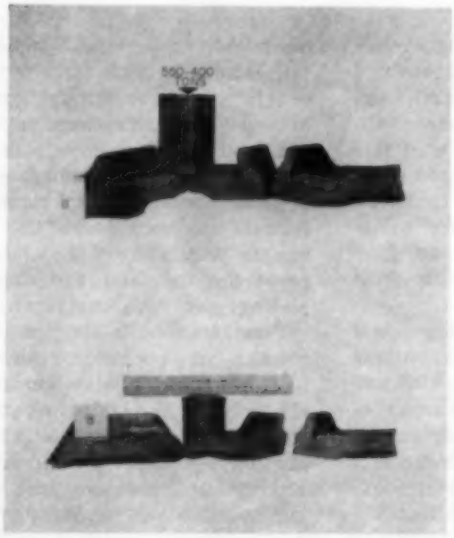
First, a simple pattern and die were constructed, and trial castings were made to determine feasibility. The trial pieces looked good.

Sample patterns were constructed following the new design, and more samples were coined. When the results were all in, the decision was made to proceed with production equipment to coin the radius to eliminate machining.

On the Road—With the tests behind them, Timken says the original pearlitic housings have been in service on freight cars for more than a year and a half. There's not the slightest sign of any difficulty.

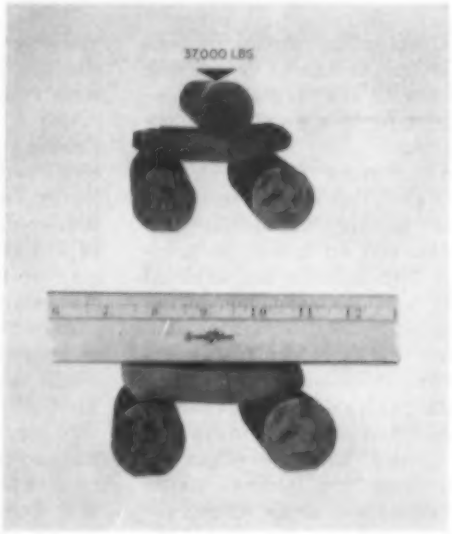
It all adds up to a case where the versatility of casting design teamed up with the strength and bearing quality of pearlitic malleable to give a part with the most yield strength per dollar.

TEST 2—BRITTLE FRACTURE

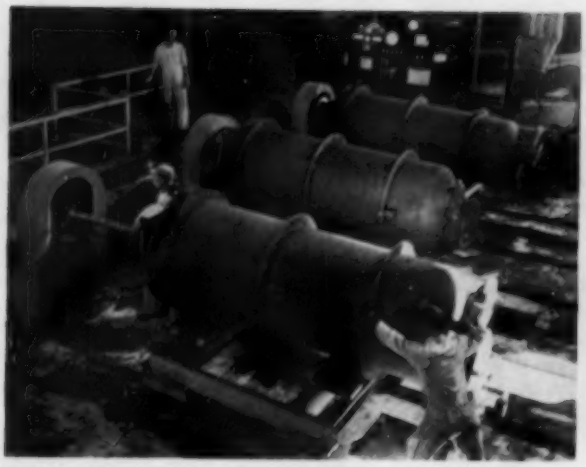


(Top) test used hydraulic pressure on unsupported section; (bottom) physical deformation showed up in casting before fracture. Cylinder also deformed

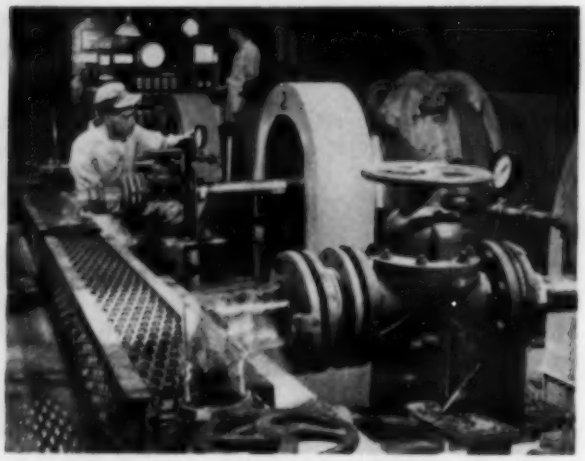
TEST 3—DUCTILITY



(Top) thinner section of casting was supported on edges and load applied through a round bar resting on unsupported portion. (Bottom) bending took place before fracture



Workers are pushing an unplated vessel into position for the closed-cycle chemical nickel plating process



Worker adjusts flow of solution at number two station. Note glass piping used throughout the solution circuit

Nickel Plating without Current

That's what they're doing at American Locomotive. With special pre and post-plating operations, intricate surfaces take on tough, dense nickel coating

By SAMUEL W. BAKER
Associate Editor

CHEMICAL nickel plating by continuous-flow technique is proving a success in the largest installation built for commercial application to date.

Two methods are employed: Closed cycle internal coating for volume plating of similar-sized products, and an immersion process for both internal and external coating and for selective plating of product parts. The installation is at the Dunkirk, N. Y., plant of American Locomotive Co.

Costs Favorable—An adaptation of General American Transportation Corp.'s Kanigen (Catalytic Nickel Generation) process, American Locomotive terms its method Alcoplate and "has introduced important preplating and post-plating operations into the procedure."

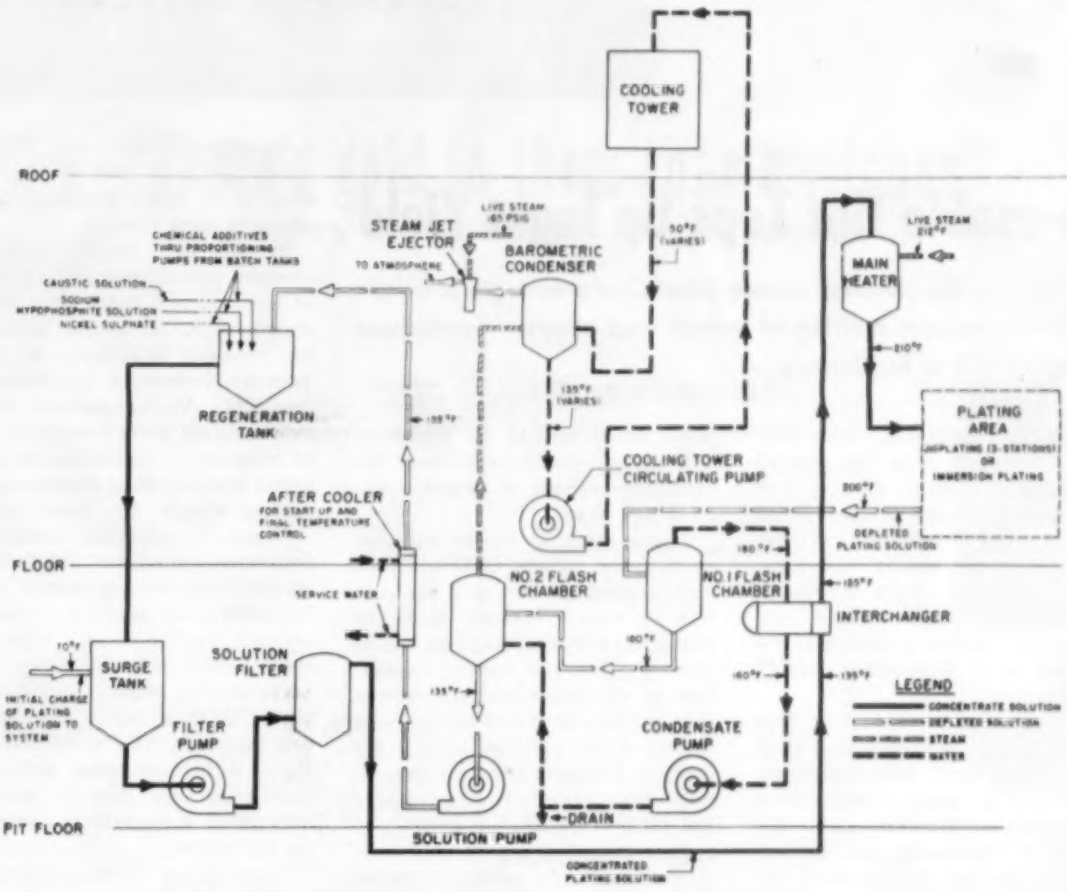
Alco is sitting tight on cost figures but believes the chemical process is "certainly no more and probably less costly than electrolytic plating." Chief savings stem from maintenance and from initial preparation of materials. Economy in using Alcoplated material comes from prolonged service life of process and transmission equipment, application to inexpensive base metals, and freedom of processed materials from contamination.

Zero Porosity—Throwing power of the chemical process allows plating intricate surfaces with uniform thickness at tolerances of ±10 per cent. Zero porosity is claimed even in plating thicknesses of less than one mil. Intermolecular bond provides excellent adhesion, and plated steel shows no flaking or spalling even when pulled to yield point. Coating hardness averages about 49 Rockwell C, and can be increased to 64 Rockwell C by post-plating heat treatment, experience indicates.

Corrosion resistance is at least equal to pure or wrought nickel in nearly all applications, says the company. Technicians explain the coating is probably amorphous as it doesn't show a nickel structure. Nickel and cobalt are the only metals that have the peculiar properties required for chemical plating, say Alco engineers.

First Uses—In its first three months of operation, Alcoplate has been used to supplement the electrolytic method in plating some 67,000 sq ft of gaseous transmission equipment for the Atomic Energy Commission against exacting specifications and test procedures. Thickness averaged 0.003 in. In addition, Alco has plated converters, valve bodies and other special products on a production basis.

Company thus far has success-



Vertical section through plant shows flow

fully plated mild steel, aluminum, copper, brass and bronze. It has found plating on nonmetallic material practical after proper surface preparation. Cleaning vats, make-up, surge and regeneration tanks as well as pumps, heaters and evaporators are lined with glass and linked with glass piping since the plating solution will deposit nickel on almost all materials except glass.

Properties — Chemical composition of Alcoplate usually is 93 per cent nickel and 7 per cent phosphorus. Assuming same thickness, it takes approximately the same time to plate any product regardless of size. In the chemical process nickel plates out at a uniform rate of 0.6 to 1.0 mils per hour, unlike electrolytic plating where amount of nickel deposited is a result of the current strength.

Preparation operations are substantially the same as those performed prior to electroplating. After suitable surface pre-treatment, products are immersed in alkali cleaner at 180° F for 10 minutes, then rinsed in cold water, pickled for 10 minutes in muriatic acid at room temperature, given a second water rinse and a second immersion in the alkali cleaner.

Equipment Required — Plating chemicals are mixed in 8-ft diameter make-up tanks, using top-mounted motor-driven agitators. Solution then moves to the surge tank of the process loop, through a preheater into the main heater where temperature is raised to 215° F. Then it is introduced into the work to be plated. Plating takes place by catalytic reduction of nickel by sodium hypophosphite at the elevated temperature.

From the product, spent liquid passes through flash evaporators which drop solution temperature rapidly and remove accumulated condensate from main heater. Moving back to the regeneration tank, concentrated solutions of caustic, nickel sulphate and sodium hypophospite from chemical feed tanks are introduced by an automatic proportioning pump to restore solution to optimum concentration. Solution, now regenerated, is pumped back to the surge tank to begin another cycle.

Licenses — First process for chemically coating nickel on metal was discovered in 1844; first U. S. patents were issued in 1916. Most present patents for chemical deposition of high-nickel low-phosphorus alloy are held by GATX. Licenses have been issued to Keystone Chromium Co., Buffalo, an Alco subcontractor, to Alco in May, 1954, and to a French combine in October, 1954.

Re-usable Hot Tops Up Ingot Yield

Speakers at the Electric Furnace Steel Conference paint bright future for vacuum melting of metals and alloys. Continuous charging still a bottleneck

TESTS on re-usable, insulated, low-volume hot tops by several steel plants making electric and open-hearth steels show prime product yield is greater than that obtained from regular hot tops. J. C. Carpenter, Ferro Engineering Co., Cleveland, brought this out at the twelfth annual Electric Furnace Steel Conference, AIME, Pittsburgh.

Mr. Carpenter explained that a C&D hot top consists of a cast-iron casing lined with insulating firebrick. It employs the usual appurtenances for protecting the bottom of the casing and preventing the flow of molten steel between the mold and hot top. It may be poured with only a slight hesitation to obtain a seal at the junction of the hot top and mold. After pouring, the supporting blocks are knocked out so that no "hanging" of the ingot will occur.

The insulating firebrick used absorbs only 30 per cent as much heat as regular fireclay brick and has an insulating value 3.1 times as great at 2600°F.

Lining Is Protected—A re-usable hot top requires that the refractory lining be capable of repeatedly withstanding contact with molten steel and the abrasion incident to the stripping of the hot top from the sinkhead portion of the ingot. To protect the insulating firebrick lining from the molten steel, a refractory veneer, about ½-in. thick, is applied to the inner face of the hot top lining before each use. This veneer is applied as a mortar, thoroughly dried before use, and forms a monolithic surface which resists penetration by the molten steel. Replacement of the insulating firebrick lining should be necessary only at infrequent intervals if the protective veneer is properly applied and dried.

Ingots made in molds with insulated low-volume C&D hot tops were poured usually at 3 per cent less by weight, molten, than the comparison ingots made in molds with regular hot tops. Evaluation of the prime product showed that the insulated low-volume tops increased the yield at least 3 per cent, at a quality level comparable with that obtained with regular hot tops.

This type hot top is easily removed from the sinkhead before the ingot is loosened, and the sinkhead has a chance to cool sufficiently to be hard enough to be gripped by the stripper crane bits without collapsing.

Other Papers—A recent development in the use of calcium compounds is the injection of calcium carbide in powdered form into molten metal to reduce sulphur. This was brought out in a paper, "Application of Special Elements to Electric Furnace Steels," co-authored by A. J. Scheid, Jr., and W. J. Mathews, Columbia Tool Steel Co., Chicago Heights, Ill.

The carbide usually is introduced into the bath under pressure of an inert gas such as nitrogen or argon. Allowance must be made for the carbon pickup that results from the injection of the carbide as 10 to 20 points can be picked up rapidly. The quantity of the carbide usually ranges from 5 to 20 lb per ton, the sulphur content being reduced about 50 per cent in a few minutes.

The carbide injection process is most effective for acid practice, but it has been used in some instances in basic practice in an effort to save time.

Promise of a bright future for vacuum melting metals and alloys in the chemical industry was predicted by E. M. Mahla, engineering research laboratory, E. I. du Pont de Nemours & Co., Wilmington, Del. Vacuum-melted, corrosion-resistant steel, essentially free of nonmetallic inclusions, is a superior material from which to make casting wheels, Mr. Mahla stated.

Under appropriate conditions, transverse endurance limit of inclusion-free, vacuum-melted steels is significantly superior to that of aircraft quality steels. Under all conditions, inclusion-free steels make casting wheels and rolls superior to those made from standard materials. He mentioned that there is evidence that pit corrosion resistance may be measurably affected by surface nonmetallic inclusions.

Interlocking Is Recommended—A need for continuous charging and casting without the necessity of breaking the vacuum in the melting chamber was emphasized by H. H. Scholfield, metals division, Telegraph Construction & Maintenance Co., London. He brought out in his paper on "European Vacuum Melting History and Practice" that the developments in pumping equipment appear to satisfy present requirements but interlocking of the diffusion pump with the pressure in the vacuum chamber so that it automatically switches off when the pressure rises above the threshold value would be an advantage, as it is not practical to follow it manually. No significant improvement is anticipated from lower pressures, although the vacuum arc furnace in which higher temperatures can be employed may lead to outstanding developments.

Next year's conference will be in Pittsburgh, Nov. 30 to Dec. 2, under the chairmanship of C. E. Sims, assistant director, Battelle Memorial Institute, Columbus, O.

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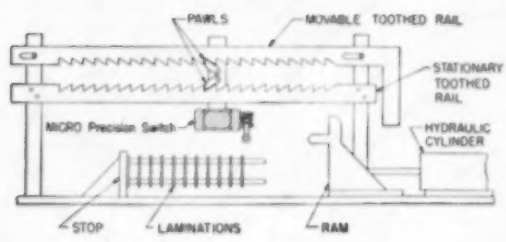
THE JOB

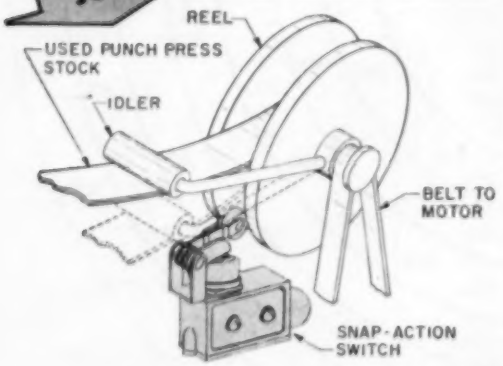


THE SWITCH

This switch spaces laminations automatically

This switch moves backward a notch at a time so that each forward movement of the ram accurately spaces laminations on this coil building machine.

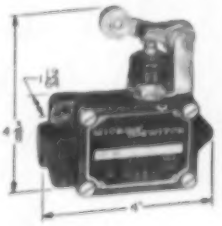
THE JOB



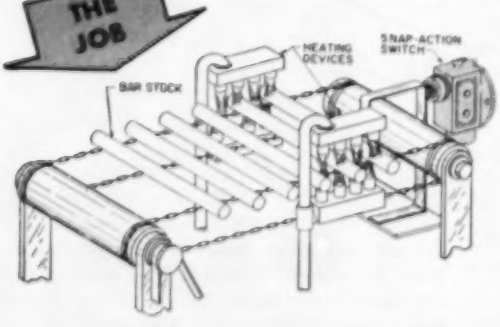
THE SWITCH

This switch operates motor so reel winds tight

Slack of the stock fed to this scrap reel drops the idler, actuates the switch and motor operates until slack is taken up.



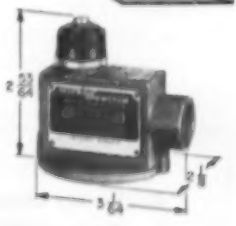
THE JOB



THE SWITCH

This switch keeps bar stock positions in furnace

When bar is in proper position in these slot furnaces, the center of the bar trips switch and stops conveyor. When the bar is removed the conveyor runs again until the next piece is in place.



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Here's Help in Hardness Conversion

- A Tensile strength x 1000 psi
- B Shore scleroscope hardness number
- C Diamond pyramid hardness number, Vickers
- D Rockwell B scale
- E Rockwell C scale
- F Brinell Hardness (10 mm tungsten carbide ball, 3000 kg load)
- G Brinell indention diameter (mm)

To use this chart, place a straightedge so that it passes through the center and any known hardness. Intersection of the straightedge and any other scale on the same side of the center shows equivalent hardness.

This nomograph prepared for

STEEL

by Bruce Fader, Chicago

Data from: Standard Steel Analyses U.S. Steel, August 1951

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MACHINE TOPICS

BY R. F. HUBER, *Machine Tool Editor*

THERE'S SOME concern among the men who make carbides that their cutting tools are too often thought of strictly as job remedies. If they had their way, carbide users would think of the material as part of a production method.

K. R. Beardslee, general manager of Carboloy, comments: "Cemented carbide users still don't fully recognize the potential of carbides on the production line. They fail to realize that when a tool goes into action, the various physical conditions surrounding the job and the line must be modified to take full advantage of that tool's capabilities."

Soup Up—Here's how they figure it. Putting a carbide tool in the holder can be like putting an automatic transmission in a Model T. If you want the transmission to work, you'll have to make some other changes in the setup. Engine ratio, differential and many other items will have to be altered before you wind up with the shiftless car you started out to get.

The same can be said for tool changes. The new tool may possess the potential for faster machining, but that may be just part of the higher production picture.

Sequence — One user, for example, put carbides to work, and then decided he could take better advantage of them if he upped the horse-power on his machine. In so doing, he increased his chip production to the point where he had to find a better way of getting the chips away from the machine.

Next, he had to improve his coolant system to get more coolant onto the tool. Then, too, since more work was coming from the machine, he had to figure out a way to get the work away from the machine to the next operation.

Up the Line — Since the next operation could create a bottleneck, it needed readjustment. Also, to keep the machine from being idle, a setup was needed to keep the jobs flowing faster to the machine.

This is the kind of case history story the carbide builders love. Too often, they feel, their product is put on the job, and no other changes are made. Their advice: When you're looking for production increases, check the whole process. One factor isn't enough.

Firms to Join

The Lodge & Shipley Co., Cincinnati lathe builder, will acquire the Hydraulic Press Mfg. Co., Mount Gilead, O., through merger. William L. Dolle, president of Lodge & Shipley, and John C. Cotner, president of HPM, issued a joint statement saying the move was decided by directors of the two companies. Details of the merger have not been announced.

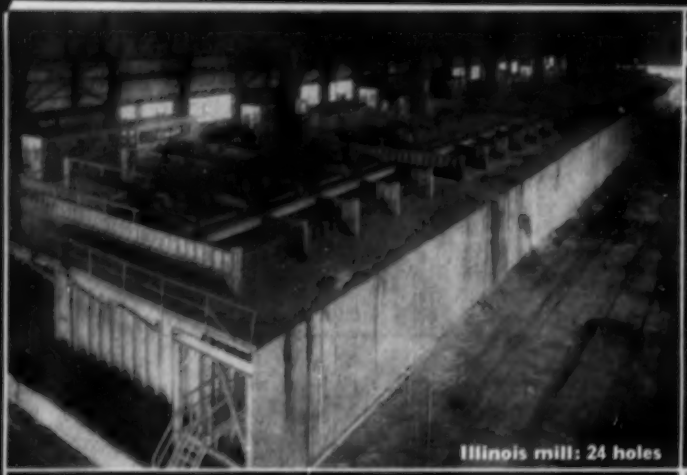
Quiet Buying

Look for the Defense Department to start it's $100 million machine tool program with little publicity. Current Washington plans are for the program to blend into regular buying.

COMING—STEEL's Modern Heat Treating Series for 1955

Heat Treating Tool Steels—Jan. 24, Jan. 31, Feb. 7, Feb. 14, Mar. 14
Vacuum Heat Treatment—Apr. 11
Steam Heat Treatment—May 9
Heat Treating:
- Aluminum—June
- Magnesium—July
- Stainless Steels—Aug.
- Copper Base Alloys—Sept.
- Iron and Steel Castings—Oct.

Temperature Control for Industrial Furnaces—Nov., Dec.



Illinois mill: 24 holes

Illinois mill: 12 holes

271 PITS

In the steel industry's current modernization program, Surface Combustion has installed 271 one-way fired soaking pits, with a capacity of 20 million tons a year. That's nearly 90% of the pits built since World War II. We believe there is a simple explanation for these facts: Surface Combustion is known for the quality of engineering that developed the jet pump recuperative system and for the experience gained in almost 50 years of working with steelmakers. 'Surface' means equipment that performs up to the customer's requirements, or better.

SURFACE COMBUSTION CORP.
Toledo 1, Ohio

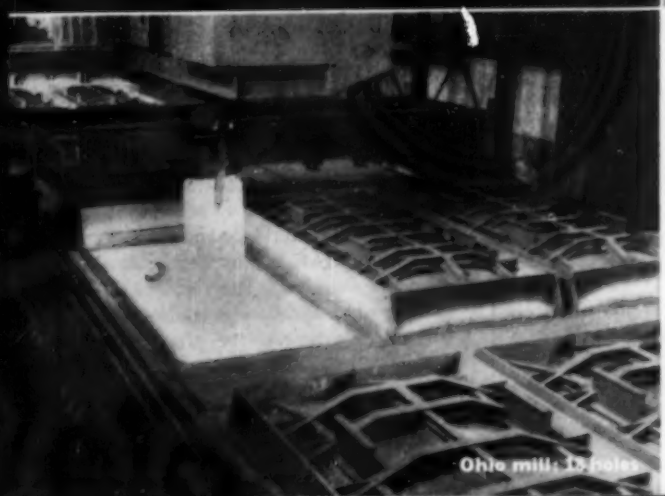
Kentucky mill: 20 holes

Michigan mill: 20 holes

Pennsylvania mill: 15 holes

IN 7 YEARS

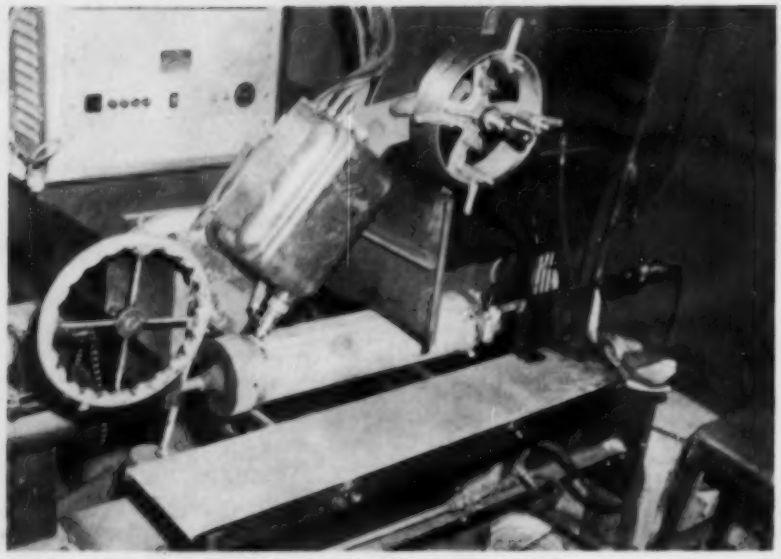
20 MILLION TONS/YR.



Surface

STEEL MILL FURNACES

Pressure Vessel Welding . . .



Condensers are submerged-arc-welded longitudinally, then heads are inert gas welded. Pipe at right floods the condenser shell with natural gas to prevent welding oxidation

Production Up 93%, Costs

That's the story when this Michigan manufacturer switched to inert gas metallic arc method. Material is mild or low alloy steel up to ¾ in. thick

INERT GAS metallic arc welding is particularly adaptable for making girth and longitudinal welds in pressure vessels. The existing code on their fabrication need not be modified to cover this use for the welds have equal or greater strength factors than comparable ones made with the hand arc method.

Sample tests were run to prove the adaptability of the process on mild and low alloy steels with a maximum thickness of ¾ in. The original sample was given a hydrostatic test at 2000 psi without failure. The minimum sample pulled at 71,000 psi, the maximum sample at 83,000 psi in tensile tests. With these satisfactory results, it was apparent that an automatic application of the process would be successful on our products.

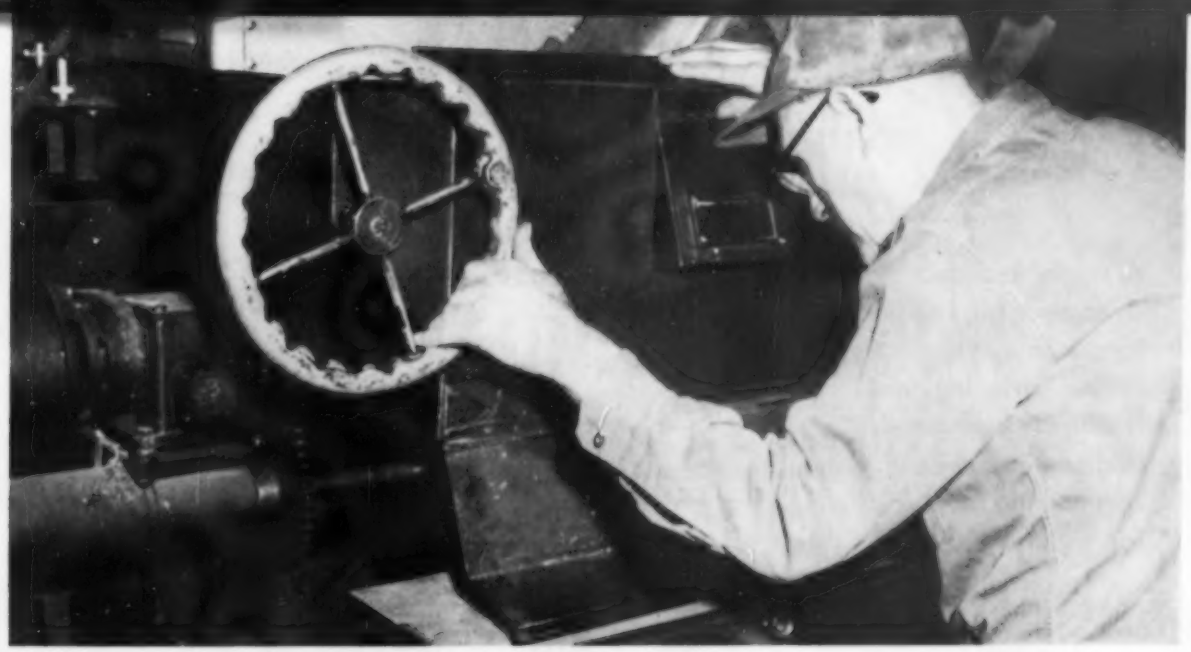
Special Fixture—In co-operation with the master mechanic and tool room supervisor, an automatic positioning fixture was developed and built in our factory. Thought was given to the possibility of making both welds simultaneously; however, this proved to be mechanically impractical.

The basic product for which the fixture was designed is a Freon gas condenser which is 6 in. in diameter and 31 in. long. Working pressure of the vessel is 470 psi, which made a design pressure of 2350 psi necessary. As welds by this machine would be made under ASME or U.L. code for unfired pressure vessels, the chance of having uncontrolled conditions in the process had to be eliminated.

Setting Standards—Upon com-

Cost Breakdown

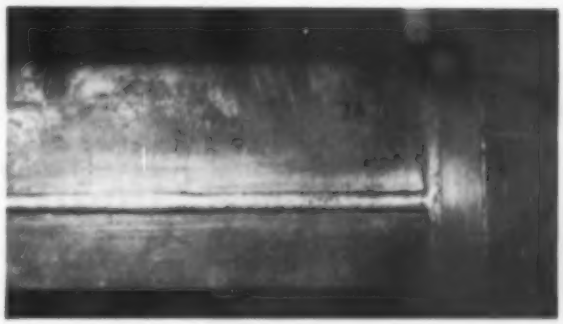
		AUTOMATIC	HAND ARC
LABOR		15.4¢	36.9¢
MATERIAL	Argon	11.2¢	Electrodes (6) 3/16" E-6012
	Wire	9.0¢	11.6¢
TOTAL COST		35.6¢	48.5¢



Metal shield confines the glare during welding. A turn of the wheel raises or lowers the welding head with relation to the rotating fixture, then remains fixed during welding

Down 36%

By L. C. NORTHARD, JR.
Welding Engineer
Acme Industries Inc.
Jackson, Michigan



Closeup of the fillet joint shows smooth, spatter-free weld which eliminates necessity of post-weld cleaning

pletion of the welding fixture a Linde SWM-3 welding head, SWM-3 arc voltage control, EG-103 electronic governor and an OM-48 side beam carriage were installed.

In a series of tests to determine maximum efficiency, the following conditions were found to produce the highest quality welds in the minimum time and were established as the standard factors for the process:

Wire—1/16 in. No. 32 cms 180 ipm
Argon flow rate—35 cu ft per hour
Welder amperage—240 amp
Arc voltage control—26 v (185 dial reading)
Fixture speed—1 rpm (19.5 surface ipm)

Operating Data — Welds are made with the unit turning on its longitudinal axis and the welding head angle at 45 degrees to the root of the fillet. The welding head leads top center by 15 degrees opposite the direction of rotation to prevent run off of the molten weld metal.

During the welding process the unit is flooded with natural gas to prevent internal oxidation. This does not contaminate the argon shield to a noticeable degree.

Passes the Tests—Underwriters' Laboratories and ASME tests were then necessary to qualify the process. These were made on a unit welded by the above procedure with the following results:

Air test—300 psi, no leaks
Air test—585 psi, no leaks
Hydrostatic test—2800 psi, no sign of failure
Shear strength:
Sample No. 1—53,410 psi
Sample No. 2—55,555 psi

Results are about 20 per cent in excess of code requirements.

Cost Breakdown—Time studies by our industrial engineering department showed a rate of 12.6 units per hour including all allowances. This is 6.5 units per hour more than produced by the hand arc method.

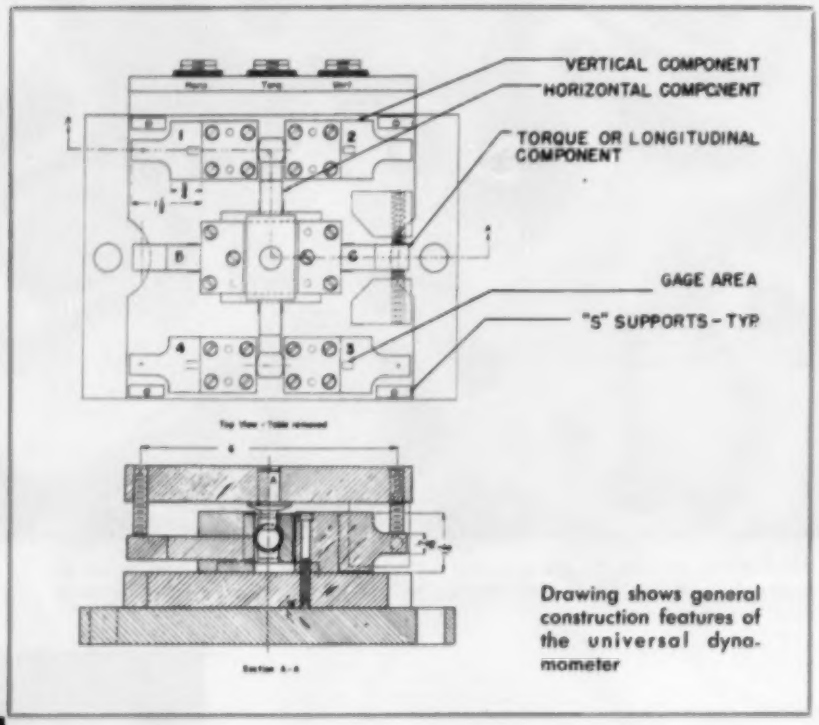
The illustrated cost breakdown does not include cost of removing weld spatter and slag that occurs with the hand arc method. Savings in postwelding cleaning costs amounted to 7.4 cents per unit. This figure would vary with the requirements of finished appearance.

This welder has been in production for several months, and we believe it is the answer to automatic welding where the flux of submerged welding is difficult to hold in position, or as in this case, is objectionable in the finished product.

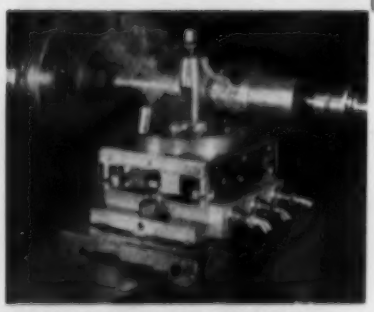
Do-It-Yourself Research

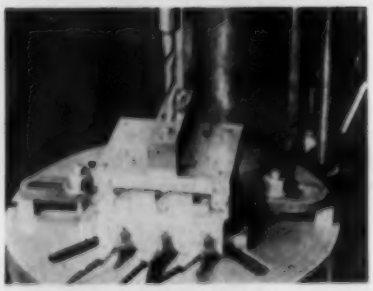
A single, compact dynamometer reads forces on turning, milling, grinding, etc. It utilizes strain gages and cantilevers—can cost as little as $65 for materials

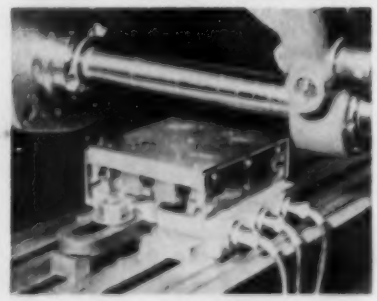
By ARMEN BOGOSSIAN
Industrial Engineering & Planning Dept.
Curtiss-Wright Corp.
Wood-Ridge, N. J.



Drawing shows general construction features of the universal dynamometer







Dynamometer checks forces on turning, drilling, milling operations. Unit reads forces in all three directions

HOW DOES research fit into the production shop?

Normally it doesn't but here's one case where you may be able to analyze your optimum cutting conditions for a variety of machining operations. All you need is a universal tool dynamometer. With about $65 worth of materials, a skilled man can build it in less than 20 hours.

Dividends—Knowing the forces involved in some of your cutting operations can help you design the proper jigs, fixtures and special tools. It also can help you put the right standard tools to work, and may aid in selecting the right cutting conditions.

Builders of machine tools can go a step further by analyzing forces to determine the stresses and deflections in the machine and also can use the force information in designing feed transmissions.

How It Works—The dynamometer is an assortment of strain gages and cantilevers. To minimize the possibility of cross-coupling between the components, necked-down cantilevers are used.

In the drawing above, cantilevers 1 through 4 read the vertical component of any load applied within a 6-in. square bounded by the four contact points on the contilevers.

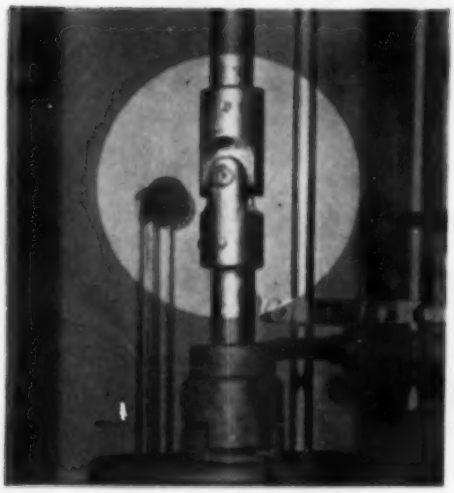
Torque — Cantilevers 5 and 6 read the torque component. Two sets of calculations determine the pound-inch units for drilling, or pounds of load for turning, where torque is the longitudinal component.

Horizontal loads are detected by a floating simple beam. These would be the radial loads in turning, the horizontal loads in planing and would not be in effect during drilling.

Results from the dynamometer are recorded on the BL202 and BL201 Brush oscillograph. Amplification of the output of each Wheatstone bridge is done by three Brush BL310 strain amplifiers.

Based on a thesis submitted by the author at the College of Engineering, New York University.

Why Moly alloy steels are in your future



STRENGTH OF UNIVERSAL JOINTS INCREASED 100%

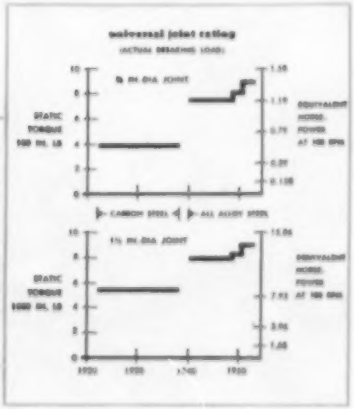
with

Moly *tool steels*

the part — **UNIVERSAL JOINTS**

the problem

In 1919 a well known manufacturer established the present dimensions for his universal joints, which are used for many types of applications such as machine tools. Although universal joints generally have a long service life, there is a steady demand for spare parts for joints installed as long as twenty or thirty years ago. Therefore, a change in basic dimensions was undesirable despite the increasing severity of requirements.



the pay-off

Since it was not feasible to change dimensions, the only way of improving performance was to increase the strength and toughness of the parts. The effectiveness of alloy steels in fulfilling this aim is shown by the improvement since 1922 in the actual breaking loads of two sizes of universal joints (figure at right). Up until 1938, only carbon steel was used. The 1940 values represent an all-alloy joint, while the 1948 and 1950 improvements resulted from better methods of heat treatment and minor dimensional changes.

If you make, use, specify or buy steels you need a copy of "ALLOY STEELS PAY OFF"

Such topics as:

Air valve stems on coal washers, anchor chain, annealing retorts, ball cages in universal joints, band saws, bolts, boring bars, bridges, bumpers for passenger cars, cable-tool and churn-drill bits, caustic evaporators, centralization feed pumps.

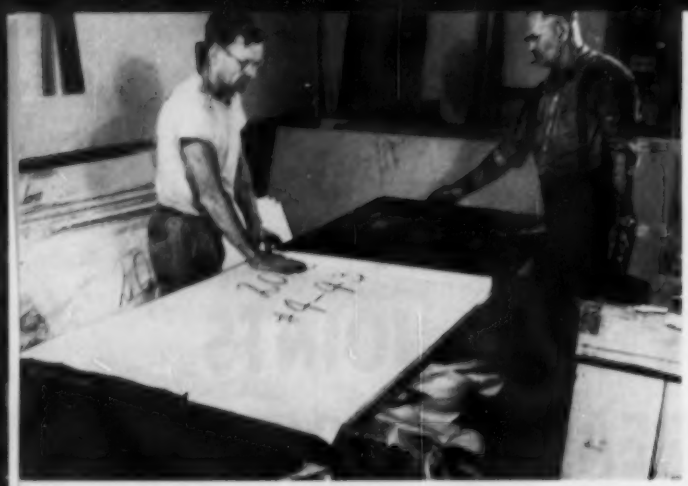
This big, fully-documented, 207-page book gives more than 50 complete case histories highlighting the many advantages of alloy steel usage . . . such as outlined above. And each case history is an idea-starter of its own! Everything from "ANNEALING RETORTS" to "TRIMMER BLADES." Get your copy today. Address Dept. S, on your letterhead, please. *Climax Molybdenum Company, 500 Fifth Avenue, New York 36, N. Y.*

This advertisement is printed in one shade of molybdenum orange, a pigment widely used for its striking color and good coverage — ideal for paint on industrial equipment . . . brings high visibility that means extra safety.

MSS-5

CLIMAX MOLYBDENUM

How to Form STAINLESS



Paper pasted on finished side of sheet protects surface from shear and press marks, makes layout easier, helps identify material. Some use adhesive tape or plastic film

Here are helpful hints on working with stainless from Armco Steel Corp. Plenty of power and protection from dents and scratches are the basic rules

Ductile types of stainless such as 17-7 or 18-8 take a full 180 degree bend. Types such as 430 are less ductile, should be bent crosswise to rolling direction when possible

YOU CAN BEND 17-7 or 18-8 sheet or strip flat on itself, with or against the grain. There is no hazard of breaking or edge cracking up to 3/16 or ¼ in. thick. Because 17 Cr stainless contains no nickel, it is less ductile and works about like carbon steel.

More power is required to form chromium-nickel types since they are stronger and work-harden more rapidly than mild steel. Do not exceed the tool manufacturer's rated gage capacity for stainless steel. It is about 4 gages less than for galvanized or hot rolled steel sheets. Springback is about twice that of mild steel, owing to its high yield strength.

Protect Surface—To minimize surface marring, dies, rollers, brake blades, clamps and other contact parts should be kept free of nicks and burrs. Flatten out center punch marks and burrs before brake forming.

One way to protect sheets in forming is to apply adhesive tape where needed to prevent metal contact with the stainless surface. Some fabricators simply paste newsprint or wrapping paper on the stainless surface with paper hanger's paste. Specially prepared strip-off adhesive papers and strippable plastic coatings will serve the same purpose.

Be sure rolls are smooth so they won't mar the stainless. Roll forming is easy, but stainless has about twice the springback of mild steel. Remove burrs and punch marks

Did you see these articles?

"Drawing Stainless — How To Make It Fit Your Product"—STEEL, May 10, 1954, Pages 134-137

"How To Solder Stainless Steel"—STEEL, May 31, 1954, page 108

"How To Weld Stainless Steel"—STEEL, May 31, 1954, page 109

A few copies are still available.

Write Readers' Service, STEEL, Penton Building, Cleveland 13, O.

How to Cut STAINLESS

Shear capacity is about four gages lighter than for mild steel. Keep blades sharp. Stainless is tougher than mild steel; needs more power. Shear beds should be covered

WHEN USING squaring shears, remember that the chromium-nickel types, 18-8 for example, are much stronger and tougher than mild steels. You need more cutting power and enough shear capacity.

A 14-gage mild steel capacity shear will cut 19-gage annealed stainless steel—16 gage will cut 20. Chromium grades such as 17 Cr require less power in shearing.

Don't skimp on blade quality and keep blades sharp. Some fabricators prefer solid high carbon, high chromium blades, but high-speed steel blades also excel. Others favor carbon steel with high-speed steel inserts on edges.

Watch Adjustment—Blade adjustment for chromium stainless steels is generally the same as for mild steel. Not so for chromium-nickel types. Here shear blades must be more closely adjusted and kept sharp. Recommended clearance for light gages of chromium-nickel steels is 0.001 to 0.0015 in.—for heavier gages 0.0015 to 0.002 in.

Protect sheet surfaces when shearing: 1. By applying protective paper to the metal; 2. By covering shear table with soft cloth or heavy corrugated paper; 3. By using nonmetallic hold-down tips on shear.

When cutting stainless on slitting and circling machines, use sharp and closely adjusted rotary cutters. Tool capacity is about four gages lighter than for carbon steel. The same precautions apply to nibblers and high-speed shears.

Sawing—Power band saws are used for both low-speed and high-speed sawing. They are especially suitable for cutting contours and for blanking and trimming. Abrasive cut-off wheels are excellent for cutting stainless tubing, molding and bar stock. Use resin-bonded wheels for dry-cutting. Speeds are high—generally from 10,000 to 16,000 sfm. Rubber bonded wheels are preferred for wet cutting, at about two-thirds dry-cutting speeds.

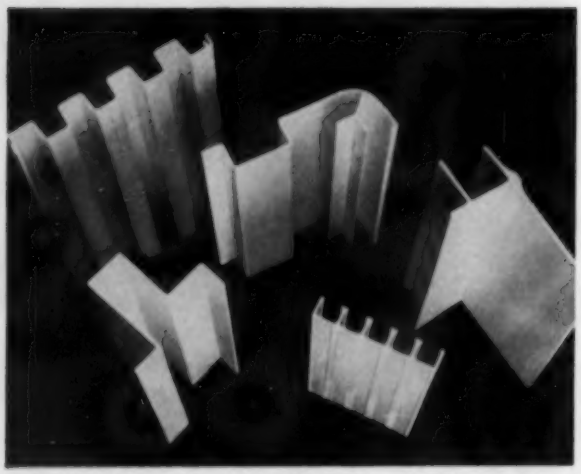
Punching—When punching and perforating chromium-nickel stainless, use up to twice the power for mild steel. Reduce press speeds 50 per cent. Closer punch and die clearance is desirable with tools sharp and closely adjusted. Hole diameters should not be less than about twice sheet thickness. A good thin stainless drawing compound or cutting oil helps in perforating, especially when working with wire size punches. Regular carbon steel practice is applicable in punching the chromium types.

Use high speed blades with 32 or more teeth per in. for hand sawing stainless. High and low speed band saws are used. Use abrasive cut-off wheels for formed sections

Hand snips are widely used to cut stainless. Keep blades sharp and closely adjusted. Use double-action or compound lever shears for heavier gages. Nibblers make job easier

Service to manufacturers

is our business



EXTRUDED SHAPES All standard alloys are available in custom shapes (solid, semi-hollow and hollow), structural, rod and bar, and in extruded tube.

SHEET AND PLATE Supplied as flat sheet, plate, coil sheet, circles in a complete range of alloys, sizes and tempers. Specialty sheets available on inquiry.

As a basic producer of aluminum, we are in the business of supplying manufacturers of end products.

Therefore, our efforts are put behind the job of serving these manufacturers—and helping them in the solution of *their* problems.

In recent years, our services have been expanded in order to keep pace with our greatly increased production capacity—which today is close to 30% of all the primary aluminum made in this country.

To give you fast personal service, we have expanded our sales offices to key cities throughout the country.

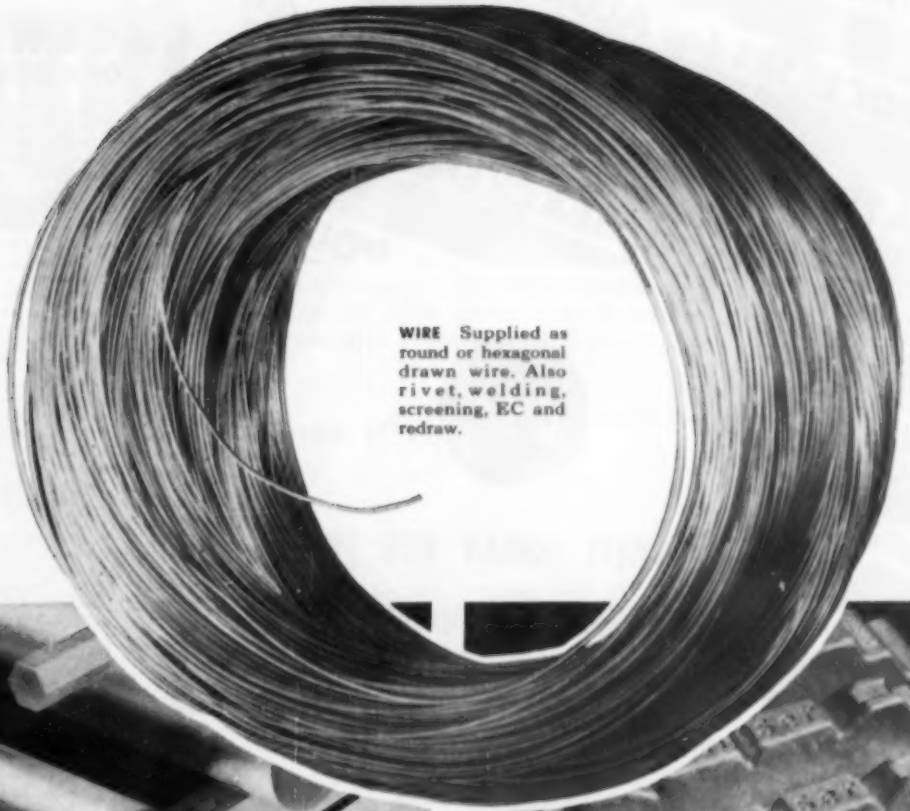
We have expanded our distributor program so that we now have a warehouse distributor in almost every major city.

We have increased our sales force and our staff of field engineers, employing specialists in many fields, such as roll-forming, extrusions, conductor, etc.

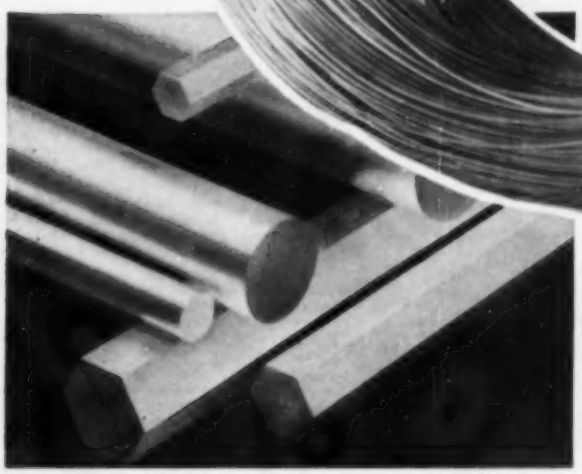
However, important as these additions are, we believe the most significant thing about Kaiser Aluminum's service is the attitude behind it. An attitude that moves men to work harder, longer, and with greater determination.

We believe that the kind of service we offer—combined with the unsurpassed quality of Kaiser Aluminum—should be of particular interest to all aluminum fabricators.

Setting the pace... in growth, quality and service **Kaiser**



WIRE Supplied as round or hexagonal drawn wire. Also rivet, welding, screening, EC and redraw.



ROD AND BAR Available in a wide range of alloys in rolled and cold finished rod and bar, round and hexagonal standard screw machine stock, hexagonal bar, redraw rod, rivet rod and round forging stock, square and rectangular bar.

PIG, INGOT AND BILLETS Kaiser Aluminum produces Pig, Ingot and Extrusion Billets in a range of alloys and sizes to meet your specific requirements.

For complete information, call or write any Kaiser Aluminum sales office or one of our many distributors, located in principal cities. See our catalog in Sweet's Product Design File or write for copy. Kaiser Aluminum & Chemical Sales, Inc., General Sales Office, Palmolive Bldg., Chicago 11, Illinois. Executive Office, Kaiser Bldg., Oakland 12, California.

Other Kaiser Aluminum products include: industrial foil, and electrical conductor. Kaiser Aluminum also supplies household, freezer and broiler foil for home uses; Shade Screening for the building industry and roofing and siding sheet for farm and industrial buildings.

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CALENDAR
OF MEETINGS

January 10-13, American Road Builders' Association: Annual meeting and exhibit, Roosevelt hotel, New Orleans. Association address: World Center Bldg., Washington 6. Executive vice president: Eugene Reybold.

January 10-14, Society of Automotive Engineers Inc.: Golden anniversary annual meeting, Sheraton-Cadillac and Statler hotels, Detroit. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

January 11-13, National Constructors Association: Annual meeting, Hotel Plaza, New York. Association address: 50 E. 41st St., New York 17. Secretary: C. B. Bronson.

January 12, Aluminum Extruders Council: Winter meeting, Saxony hotel, Miami, Fla. Council address: 209 Washington St., Boston. Secretary: Phillip Lemelman.

January 12-14, Southern Industrial Distributors Association: Midyear meeting, Edgewater Gulf hotel, Biloxi, Miss. Association address: 208 Peachtree Arcade, Atlanta 3. Secretary: Ted Pugh.

January 14-15, Machinery & Allied Products Institute: Economic conference, Mayflower hotel, Washington. Institute address: 1200 18th St. N.W., Washington 6. Secretary: Charles W. Stewart.

January 18-20, Caster & Floor Truck Manufacturers Association: Annual meeting, New Weston hotel, New York. Association address: 27 E. Monroe St., Chicago 3. Executive secretary: Harry P. Dolan.

January 18-20, National Industrial Conference Board Inc.: General session for all associates, Hotel Astor, New York. Board address: 247 Park Ave., New York 17. Secretary: Herbert S. Briggs.

January 19-20, Steel Shipping Container Institute Inc.: Winter meeting, Hampshire House, New York. Institute address: 600 Fifth Ave., New York 20. Secretary: L. B. Miller.

January 20, Cutting Tool Manufacturers Association: Annual meeting, Oakland Hills Country Club, Detroit. Association address: 616 Penobscot Bldg., Detroit. Secretary: Martin J. Ewald.

January 20-21, Radio-Electronics-Television Manufacturers Association: Symposium on printed circuits, University of Pennsylvania, Philadelphia. Association address: 777 14th St. N.W., Washington 5. Secretary: James D. Secrest.

January 20-21, Steel Plate Fabricators Association: Annual meeting, Palmer House, Chicago. Association address: 70 W. Monroe St., Chicago. Executive director: J. Dwight Evans.

January 21, Engineers Joint Council: General assembly, Hotel Statler, New York. Council address: 29 W. 39th St., New York 18. Secretary: Stewart E. Reimel.

January 21, Malleable Founders' Society: Semiannual meeting, Hotel Cleveland, Cleveland. Society address: 1800 Union Commerce Bldg., Cleveland 14. Managing director: Lowell D. Ryan.

January 23-27, Associated Equipment Distributors: Annual meeting, Conrad Hilton hotel, Chicago. Association address: 30 E. Cedar St., Chicago. Secretary: P. D. Hermann.

January 24-25, Industrial Heating Equipment Association Inc.: Annual meeting, Sheraton-Cadillac, Detroit. Association address: 412 Fifth St., N.W., Washington. Secretary: T. F. Sheckels.

January 24-27, American Management Association: General management conference, Statler hotel, Los Angeles. Association address: 330 W. 42nd St., New York 36. Vice president-secretary: James O. Rice.

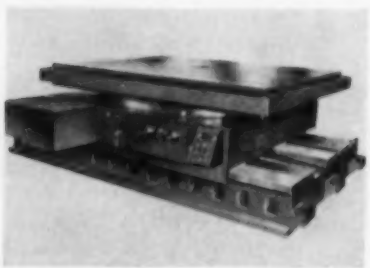
January 24-27, Plant Maintenance & Engineering Show: International Amphitheatre, Chicago. Information: Clapp & Poliak Inc., 341 Madison Ave., New York 17.

January 24-28, International Heating & Ventilating Exposition: Commercial Museum and Convention Hall, Philadelphia. Information: International Exposition Co., 480 Lexington Ave., New York 17. Manager E. K. Stevens.

NEW PRODUCTS and equipment

Reply card on page 91 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue.

Rotary Table Has Two Functions



Available sizes include 8, 10 and 12 ft square platens, 8, 10 and 12 ft round platens, 8 x 10, 8 x 12 and 10 x 12 ft rectangular platens. Power feeds to the rotating table top, as well as longitudinal traverse along the runway. It is possible to move the work piece at right angles to the runway of a floor-type horizontal boring machine and also do circular milling and indexing in one setup. You can handle large work requiring machining to close limits.

All controls are regulated by pushbuttons. They and the dial for selecting the feed rate are enclosed within one housing. A dial indicator for indexing the table to predetermined settings is provided. Giddings & Lewis Machine Tool Co.

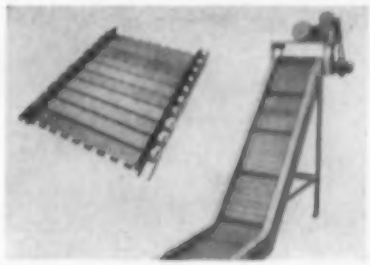
FOR MORE DATA CIRCLE REPLY CARD NO. 1

Hinged-Steel Belt with Dimpled Surface

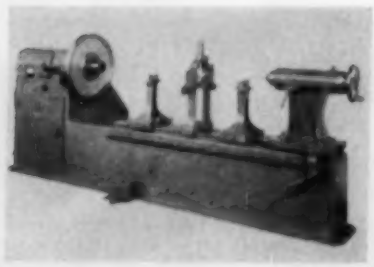
The design assures the drop-off of flat pieces and scrap, even when the belt is covered with oil, compound or is slightly magnetized. It will handle hot, heavy and abrasive materials that quickly deteriorate coventional conveyor belting. All belting is standardized to permit tailored installations from mass-produced and stocked component parts.

The dimpled design is available in standard light-duty 2½ in. pitch hinged-steel belt, with dimples spaced on ¼ in. centers. The belt has been designed to eliminate discharge problems experienced with flat-surfaced belts handling small, flat, light-gage metal parts or scrap. May-Fran Engineering Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 2



Horizontal Speed Lathe Used For Polishing



This machine has been used for polishing axle shafts, torsion bars and other parts. It consists of a cabinet base, a head stock and a tailstock. The spindle is hardened and ground and rotates on antifriction bearings encased in a special cartridge-type housing. The spindle nose can be made to customer requirements. A combination flywheel and hand wheel is provided.

A dry disc clutch of ample capacity is mounted on the spindle and is disengaged by a hand lever mounted on the side of the head stock. The work spindle is driven by multiple v-belts through a special reduction unit. The spindle rpm control is mounted on the side of the head stock. Acme Mfg. Co.

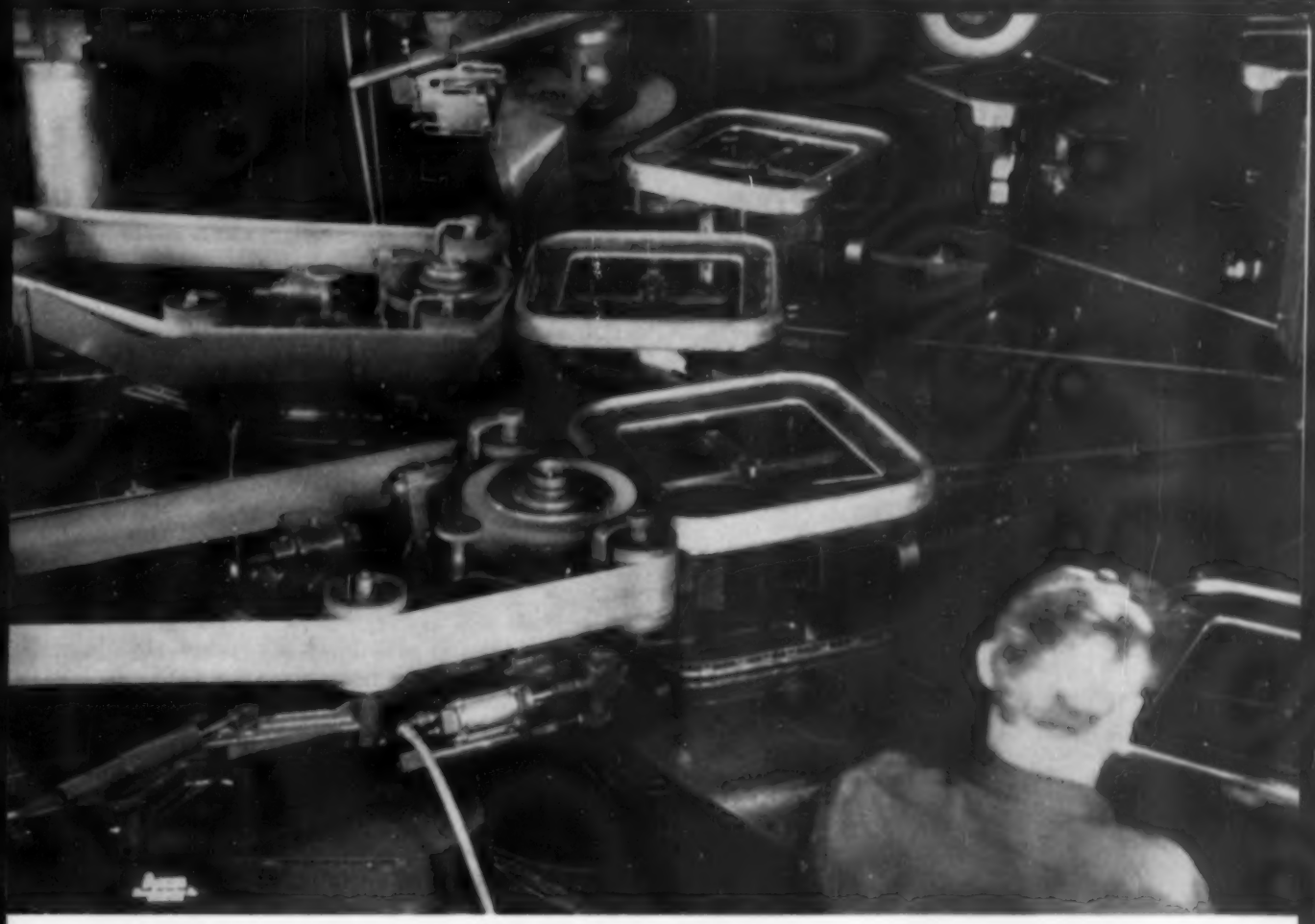
FOR MORE DATA CIRCLE REPLY CARD NO. 3

Polishing goes automatic

goes automatic

...with BEHR-MANNING coated abrasive belts

Better finishes and Better production with BEHR-MANNING coated abrasives and methods



Fast-cutting BEHR-MANNING® Abrasive Belts on these Acme Manufacturing Company automatic machines clearly demonstrate the production increase possible with modern mechanized methods. In the photo above, aluminum parts are automatically rotated to the polishing stations. At left, bumper guards travel automatically past a series of floating head polishing lathes equipped with BEHR-MANNING Belts. For details on these and other modern methods, write Behr-Manning, Troy, N. Y., Dept. S-1.

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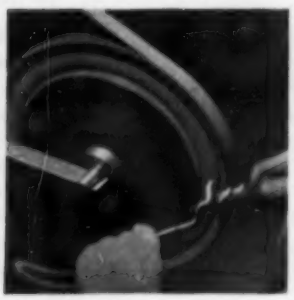
Belt polishing saw arbors with a two-spindle indexing fixture.



Off-hand contour polishing on narrow belt.

Orbital type sanders save time and produce finer finishes.

Cutting power of the abrasive disc increases production.

G-12

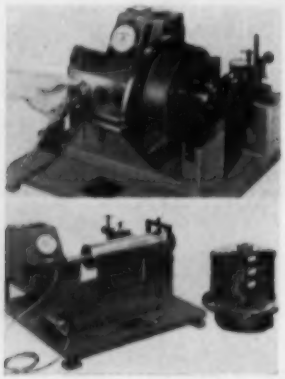
Profilometer Pilotor Measures Roughness

For measuring roughness across the raceways of small ball bearing races, the pilotor accommodates inner and outer races ranging from 5/16 to 1 in. OD. On other parts it can be used for measuring on OD and ID's of about 1/32 to ¼ in. radius.

An amplimeter unit (connected to the tracer) shows rms average roughness height on a meter in microinches. The tracer is mounted on a carriage and is moved into and away from tracing position by the lever shown. The spindle is driven from a motor drive unit through a variable-radius eccentric. A speed selector and associated amplifier provide the proper tracing speed for surfaces of different radii. The spindle rotation is essentially harmonic. Micrometrical Development Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 4

Air-Mechanical Gage is Highly Sensitive



A dial indicator gaging unit checks the concentricity of the large counterbores. The mutual axis of the main bearings is in refrigerator compressor cylinder housings. The air unit, a 5000 to 1 magnification Dimensionair, checks the squareness of the cylinder bores with the axis of these bearings. For both inspections the bearing axis serves as reference. After the square checks have been made, the mandrel locks are released and the dial indicator concentricity unit is moved into position. Minimum and maximum indicator readings are observed.

The high sensitivity of the 5000 to 1 Dimensionair, combined with reference provided by the precision mandrel and V-blocks, are said to give the gage exceptional accuracy. Federal Products Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 5

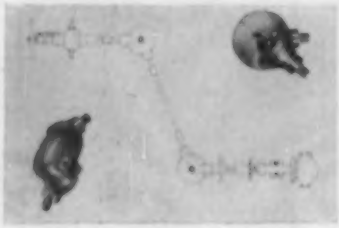
Indexing Work Holder is Simply Designed

Small and lightweight, the Model MT-1300 holds work up to 6 in. in diameter, of any face width. Work is mounted on a simple fixture and held by a draw bar through the hollow, heat-treated-and-ground spindle. The spindle itself may be locked in any position; the graduated swivel joint allows the work to be pivoted and clamped in any position from horizontal to vertical. Index plates are easily changed by removing a single nut and are available with any number up to 60 notches.

The indexing work holder is for use on milling machines and on pantographs. Johnson & Bassett Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 6

Geared Joint to be Used for Bends



This device transmits torque around bends with a system of bevel gearing. It has no maximum angle of operation, working at any angle up to 360 degrees.

The primary use for the geared joint is for making sharp bends with flexible shaft or reach-rod remote controls for valves, as shown in the photo. When installing valve controls, it is often necessary to make sharp bends in the controls to avoid obstacles. The geared joint makes it simple to detour around these obstacles, since the workman can set the joint for any angle necessary. The joints are available in 40, 160 and 250 in. for maximum recommended operating torque of 500, 200, and 3500 lb in. respectively. Stow Mfg. Co.

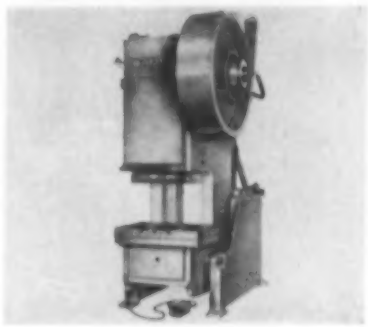
FOR MORE DATA CIRCLE REPLY CARD NO. 7

Fabricated Press with Centralized Controls

Its long flanged slide which has barrel-type adjustment is a special feature. Slides have box-type cast construction designed to eliminate way deflection. They feature long barrel-type manual slide adjustment, with the rod extended to the top of the slide flange for ratchet wrench operation on standard presses. An adjusting rod lock is provided. An extra is the power slide adjustment.

The large diameter slide adjusting screw is always guided within the barrel of the slide even at maximum adjustment. The clutch is a patented combination air-operated friction clutch and brake. Electrical controls are centralized and may be mounted in a centralized press control cabinet or special cabinet-type panel legs to include all electric and air controls. Minster Machine Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 8

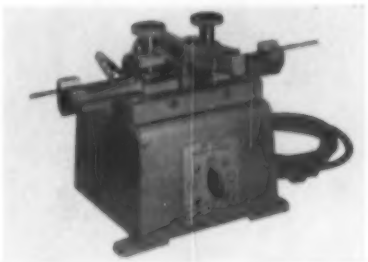


Electric Brazer for Band Saw Blades

It utilizes resistance heat for melting down the soldering metal. Single phase 50 or 60 cycle, 110, 220 or 440 volt ac current can be used. For two or three-phase power lines (50 or 60 cycles) special wireing from switch to power line is essential. Two spring devices hold back the edge of blade against the back rail to insure a perfectly straight braze.

Brazing takes only a few seconds. If too much current is turned on, the saw will melt at the point of brazing and break the electric circuit. Oliver Machinery Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 9



Lift Truck Does Heavy Work

The lifting fork is forged as one hinged piece of alloy steel. It is adjustable to suit size and shape of every load. Tiering frames have extra-heavy duty reinforced shipchannels. The built-in roller tracks and hardened and ground steel rollers are mounted on antifriction bearings. The truck will turn around and face a load in an aisle that is as wide as the machine is long. Functional units include a hydraulic system and counter weighing.

Centralized controls are within arm's reach of the operator. The hoist, tilt and travel operate singly or together. Oversize pneumatic tires make for soft riding and cushion-handling of most delicate lifts. It comes in 5, 7½, 10 and 15 ton capacities. Silent Hoist & Crane Co. Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 10

Air-Hydraulic Cylinder for Smooth Control

This cylinder has been developed to provide smoothness and precise control of hydraulic power from any shop air supply. Of coaxial design, it surrounds the oil cylinder in the coaxial unit, avoiding excessive length. Expanding exhaust air helps cool the oil to assure dependable operation.

Automatic models are available with built-in controls for speed, direction, traverse and automatic recycling. Standard models can be remotely controlled with conventional valving and piping. The unit develops hydraulic piston thrust of 3.14 x airline pressure and pull of 2.7 x air pressure. Modernair Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 11

Portable Tester for Nonferrous Alloys

It makes accurate Brinell tests on all nonferrous alloys. A removable test head makes it possible to test parts of any size or shape, and the instrument can be used in any position, with or without base. It can be set to pop off at 62½, 125, 250, 500, 750, and 1000 kg.

The tester has a narrow and shallow nose at the anvil, so that it can be used in small spaces. Dimensions of the unit are: throat 4 in. deep; gap 10 in. high, with either a 10 mm or 5 mm ball. Its weight is only 26 lb (5 mm and 10 mm balls are used where a small impression is desirable; a 5 mm ball with a 750 kg load will cover the same hardness range as a 10 mm ball and a load of 3000 kg.). The unit weighs 26 lb. Andrew King.

FOR MORE DATA CIRCLE REPLY CARD NO. 12

Metal Powder Processing with Gyratory Screen

Gyratory motion applied to the mesh for processing metal powders (sieving) on a horizontal plane eliminates the bouncing action of the particles. This was the main cause of the clogging of the shaker screen.

The Cascade machine combines the high capacity and nonblinding properties associated with the gyratory screen principle, along with the automatic and continuous rejection of oversize material. It consists of three superimposed circular screens vibrating with a gyratory motion. It is powered by a ¾ hp electric motor and can be mounted on a mobile stand or suspended from the ceiling. The gyratory unit is accurately balanced so that no vibration is transferred to the static part of the machine. The sieving assembly is contained in a dust-proof housing Russell Constructions Ltd.

FOR MORE DATA CIRCLE REPLY CARD NO. 13

Tractor Shovel Has Increased Bucket

This gives the HA Payloader a capacity of 18 cu ft and a struck-load capacity of 14 cu ft. The bucket arm design allows great breakout action and 40 degrees of tipback. A hydraulic accumulator minimizes load shocks and stabilizes the hydraulic controls.

Torque converter drive and a full-reversing transmission are combined to assure fast operating cycles and ease of operation. A sealed and pressurized hydraulic system has been incorporated. Double-acting rams operate the boom arms and the bucket. Other improved features include: New ignition lock, dust-proof distributor, new pin lock design, increased drawbar pull, a new parking brake. Frank G. Hough Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 14

Circular Sawing Machine Works at High Speed

The model No. 5, high-speed circular sawing machine can cut 43 in. diameter aluminum billets. It features a steel gear case housing a heavy-duty, helical gear train mounted on preloaded roller bearings. The saw head ways have nonmetallic wear strips and forced feed lubrication. Variable saw feed is by hydraulic cylinder. The drive of the gear case is through multiple v-belts and pulleys. A 150 hp, dc, totally-enclosed motor operated by an ac-dc motor generator set gives variable speeds within an 8:1 ratio.

Ample clamping of large stock is provided by a heavy upper clamp and gooseneck. The elevating screw, connected across the top of the housing, furnishes movement to the upper clamp. Powered roller conveyors extend on both sides of the vise. Each section can be elevated independently to facilitate movement of the stock and can be reversed if desired. Motch & Merryweather Machinery Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 15

Indicating Controller with On-Off Throttling Action

For use with simple industrial processes, the Model 41A Pneumatic controller provides sharp on-off or narrow band proportional control of such variables as temperature, pressure, liquid level and humidity. When equipped for on-off action, it snaps the control valve from full open to full close when the measurement crosses the control point, handling any process with large capacity-demand ratio and negligible lag.

For processes requiring throttling action, it is equipped with a proportional unit adjustable from ¼ of 1 per cent up to 25 per cent of scale. A simplified blast feedback proportioning mechanism is used. The left-to-right indicating scale, with white-on-black numerals and graduations, has been lengthened to 5 in. Case size is 11¼ x 9 x 4¾ in. Foxboro Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 16

Flexible Connectors Control Thermal Expansion

This seamless flexible phosphor bronze tubing has brass N.P.T. male fittings attached to each end. A wire braid covering adds strength.

The connectors can be used to dampen vibration, to take care of expansion and contraction in risers and supply lines, to connect outlets which do not line up and to compensate for other piping travel. They are easy to install in cramped spaces. For controlling thermal expansion in wet heating systems, the assemblies are available in diameter sizes ¼ through 1½ in., in over-all lengths 8 through 28 in. American Brass Co.

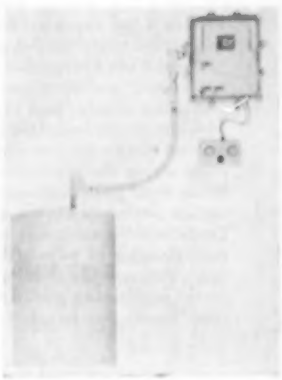
FOR MORE DATA CIRCLE REPLY CARD NO. 17

Recorder-Controller is Self-Balancing

The series 42 radio frequency capacitance bridge was designed primarily for the measurement and control of levels of liquids, granular solids, interface and other conducting or nonconducting substances. It may be used for other process variables, such as moisture content or composition, which cause a direct change in dielectric constant.

The instrument is essentially a capacitance bridge, one leg of which is for the capacity under measurement. The opposing one is the motor driven rebalance capacitor. Pen speed is 3.5 seconds for full scale travel. The range of terminal capacitance is 20 to 500 mmfd and up. Sensitivity is ±0.05 per cent of span. Linearity vs capacity change is 0.25 per cent; repeatability vs capacity changes is ±0.25 per cent. Input power is 117 volts, 60 cycles per second, 18 VA. Fielden Instrument Division, Robertshaw-Fulton Controls Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 18

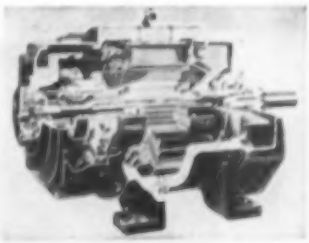


D-C Motor Changes Speed Rapidly

Dynamic response is said to be standard performance with the Super T motor. Design features mean ability to take full load and overload, to change speed rapidly, to maintain torque and tension and reverse and stop quickly. Lower mechanical inertia, lower electrical inertia and high commutating have been combined to cut time required to accelerate to full speed.

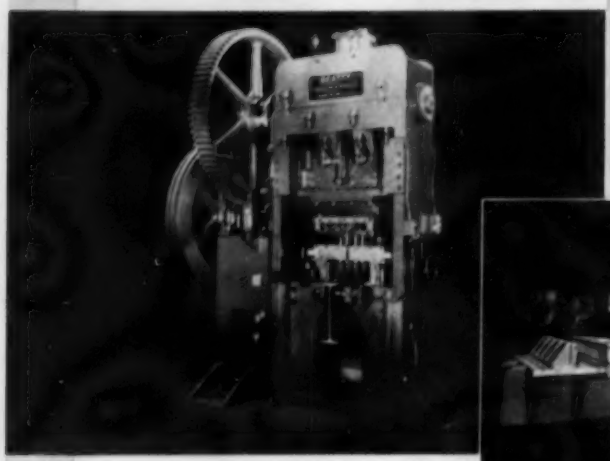
The motors are being produced in sizes from 20 to 100 hp. Mechanical enclosures have been developed to assure protection under all operating conditions. They are designed to operate through wide speed ranges. All totally enclosed motors use Class B insulation and are rated for 75° C temperature rise operation. Reliance Electric & Engineering Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 19



Beatty Beam Punch has ADJUSTABLE TOOLS

–punches flanges in "I" and WF beams!



BEATTY Horizontal Hydraulic Bulldozer for heavy forming, flanging and bending.

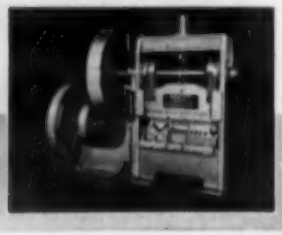
Here's a new versatile Beatty machine that is ideal for the structural steel fabricator who runs a miscellaneous job shop and requires frequent set-up changes. The new guillotine beam punch, with 200 ton capacity, features built-in adjustable tools for flange punching "I" and Wide Flange beams. A turn of a handwheel provides quick change of punching centers and synchronizes punch with die at the same time. These tools consist of two frames which open and close about the center line of the beam. It has four punching units; minimum inside setting is 2¼", maximum 6¾". Centers between inside and outside punches can be adjusted from 2¼" to 3½". For specific details on improving metal fabricating production—consult your Beatty engineer!

BEATTY Guillotine Beam Punch. Punches webs and flanges in "I" beams from 6 to 30 inches.

BEATTY Spacing Table handles web and flange punching without roll adjustments.

BEATTY
MACHINE & MFG. COMPANY
HAMMOND, INDIANA

BEATTY Gap Type Press for forming, bending, flanging, pressing. Capacity 200 tons.



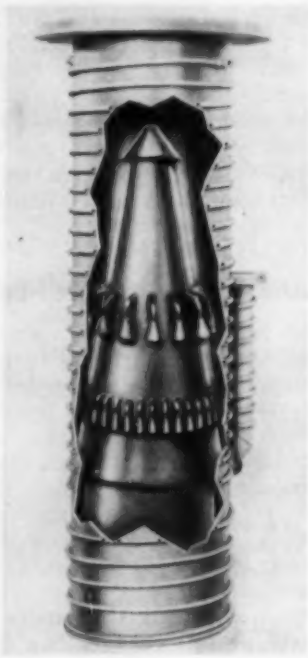
BEATTY Guillotine Bar Shear for angles, bars, rounds, squares without changing tools.

NEW PRODUCTS and equipment

High Vacuum Pumps

. . . new design concept

This new series includes oil diffusion and booster pumps. They have increased pumping capacity over the critical pressure ranges and will exhaust to substantially higher fore-pressures. Both types of pumps embody a design concept called the Ring-Jet, which is said to increase pumping capacity 100 per cent. It replaces the conventional jet cone with a ring of jets, permitting the cross-section area of the air-flow path to be increased without increasing the distance from the beginning of each jet stream to the nearest condensing



surface. There is no increase in the volume of oil vaporized. Fore-pressure tolerance is substantially higher than afforded by conventional designs. The 6-in. booster pump is 2.8 millimeters; the 16-in. pump is 0.4, both a normal heat imput. They operate efficiently with smaller mechanical fore-pumps.

The diffusion pump is available in 4, 6, 10, 14 and 16 in. sizes. The booster pump in 4, 6, 10 and 16 in. sizes. F. J. Stokes Machine Co. Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 20

FREE LITERATURE

Catalogs and Clip Sheets

Use these reply cards to bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue.

Steel Bolts

Republic Steel Corp. describes high strength structural steel bolts, the newest product of its Bolt and Nut Division. Eleven advantages are covered—7 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 21

Rod Mills

Waterbury Farrel Foundry & Machine Co. covers its line of tandem mills used for high speed reduction of nonferrous and ferrous rods—Circular 729 R, 8 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 22

Strip

Penn Precision Products Inc. offers general information on precision-rolled beryllium copper, phosphor bronze, nickel silver, chromium copper and copper strip —Bulletin 5, 4 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 23

Valves

Edward Valves Inc. subsidiary, Rockwell Mfg. Co., details its valves for boiler rooms, petroleum service, industrial and technological plants—Catalog 105, 27 pages.

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Cemented Carbide Blanks

Firth-Loach Metals Inc. describes its Firlomet cemented carbide blanks. Prices and terms are discussed and the modern carbide plant is described—Catalog No. 1, 20 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 25

Barrel Finishing

Minnesota Mining & Mfg. Co. offers two booklets on barrel finishing techniques and products: "Barrel Finishing" and "Abrasive Chips and Compounds for Barrel Finishing"—10 and 4 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 26

Stainless Tubing

Babcock & Wilcox Co.'s "B&W Seamless or Welded Stainless Mechanical Tubing" outlines advantages offered to design and fabrication engineers—Bulletin TB 365, 6 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 27

Air, Electrical Hoists

Ingersoll-Rand Co. details a full line of air and electric hoists for handling bulk materials of all types—Form 5300-A, 44 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 28

Steel Shapes

Commercial Shearing & Stamping Co. covers 25 standard circular steel shapes made with dies they have in stock—Catalog P-3, 23 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 29

Wattage Control

Blue M Electric Co. describes its method of fully automatic proportional wattage control for straight line temperature throughout the entire oven range—8 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 30

Induction Heating Control

Minneapolis-Honeywell Regulator Co. covers automatic temperature control for induction heating equipment—Bulletin HT-1.

FOR A FREE COPY CIRCLE REPLY CARD NO. 31

Hardness Tester

Steel City Testing Machines Inc. explains its Color-Glance principle that makes automatic Brinell testing possible. A brief description of the Models KDR-6E and KDR-10E and brief specifications for both are given.

FOR A FREE COPY CIRCLE REPLY CARD NO. 32

Metal Protection

American Chemical Paint Co. offers a concise description of chemicals for metal protection and paint bonding—4 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 33

Fork Trucks

Lewis-Shepard Products Inc. describes its Model M, a high lift

For free literature, editorial clips or more information on products described in this section, circle the corresponding number at left. Fill in box below for articles or advertisements not numbered.

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electric straddle type fork truck available in articulated and narrow styles—Circulars No. 35 A and 35 B, 4 pages each.

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Metallizing

Metallizing Engineering Co. Inc. offers case histories on how metallizing is saving time and money in production, salvage and maintenance work—*Metco News*, Vol. 7, No. 5, 5 pages.

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Liquid Chillers

Worthington Corp. pictorially and graphically illustrates packaged liquid chillers. Specifications, dimensions and applications of various sizes are included.—Bulletin C-1100-B52, 15 pages.

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Heaters

Dravo Corp. describes eight metalworking applications where warm air space heaters temper large volumes of fresh make-up air for plant ventilation—Bulletins 560-5, 560-13, 560-30, 560-33, 560-36, 560-41, 560-45, 560-67.

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Die Casting

Hydraulic Press Mfg. Co. suggests "A New Approach to Die Casting." Its line of die casting machines is described—Bulletin No. 5400.

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Decimal Equivalent

Chicago Latrobe offers a wall chart (18 x 24 in., printed in three colors) showing decimal equivalents and tap drill sizes for wire gage, letter size and fractional size drills.

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Heat Treating

The Metal Treating Institute offers "Cost Accounting for Heat Treating." It includes a basic cost system that can be adapted to all heat treating operations—16 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 40

Valve Maintenance

Cooper Alloy Foundry Co. covers 75 questions and answers which help in the selection and maintenance of stainless steel valves—7 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 41

Protective Atmospheres

General Electric Co. describes the use of protective atmospheres to prevent deterioration of metals during heat-treating — GEA-5907, 12 pages.

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Gear Unit

Philadelphia Gear Works Inc. talks about its line of Hi-Speed gear units for speed reduction and increaser service—Catalog HI-542.

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Rubber Products

Quaker Rubber Corp. Divison, H. K. Porter Co. Inc. has a case-bound catalog on its industrial rubber products—58 pages.

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EDITORIAL REPRINTS:

Nickel Plating

On p. 66 there is a description of nickel plating without current. With special pre and post-plating operations, intricate surfaces will take on tough, dense nickel coatings.

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Pearlitic Malleable

The need for castings stronger than malleable with properties approaching a good grade steel forging lead to the development of this material. On p. 62 you'll find its description.

FOR A FREE COPY CIRCLE REPLY CARD NO. 46

Welding

When inert gas automatic welding is used, production is up 93 per cent, costs are down 36 per cent. So says the article on p. 74. Here's a description of the technique.

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Steelmaking Centers

New statistical surveys show that Slicks and Hog Creek are the metalworking and steelmaking geographic centers of the U.S. They're both in Ohio. The article, p. 38, covers the population and business trends that have brought fame to these remote spots.

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STEEL

January 10, 1955

Market Outlook

THE STEEL INDUSTRY is optimistic about the future: It increased its capacity again; it's continuing to modernize its plant; and it's studying scores of new steels and applications.

RECORD CAPACITY—The capacity increase is 1,497,900 net tons of ingots and castings over that of a year ago. On Jan. 1, 1954, the annual ingot capacity was a record 124,330,410 tons. Now the record is 125,828,310 tons, the American Iron & Steel Institute reports. The latest increase marks the eighth consecutive year of expansion. While the increase is not as large as that of any of the preceding seven years, it is remarkable that it approximated 1.5 million tons when you consider capacity rose 6.5 million tons in the preceding year and 9 million tons in the year before that.

MORE SUPPORT—To support the increased steelmaking capacity, the industry boosted its blast furnace capacity 1,969,710 net tons in the last year. Now the annual blast furnace capacity is a record 83,971,100 tons, the institute says. To fuel its blast furnaces, the steel industry expanded its coke capacity to 72,684,750 net tons a year.

One-fifth of the latest ingot capacity increase took place at Inland Steel Co.'s plant at Indiana Harbor, Ind. Its capacity rose 300,000 tons. Now it has 5 million tons. United States Steel Corp. raised its capacity 162,000 tons.

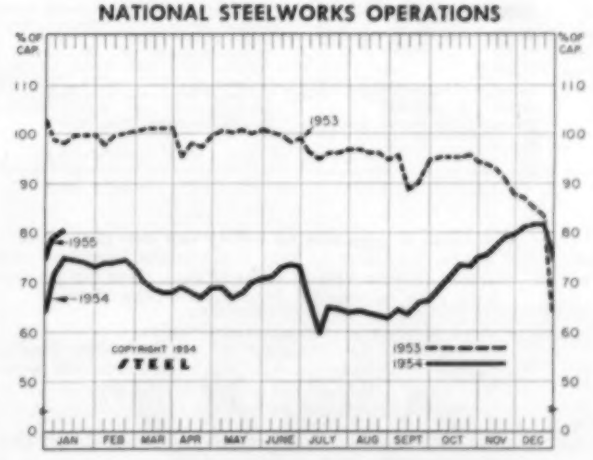
NO STOPPING—The steel industry has spent a lot of money in expansion and modernization. But it's not stopping. Armco Steel Corp. plans to spend around $30 million to improve its plants and equipment this year. That's about the same amount it spent in 1954 and 1953. Jones & Laughlin Steel Corp. plans to spend $51 million in 1955 on plant improvements and new facilities. Other producers, too, are continuing to modernize facilities and practices.

UNDER STUDY—Not only do capacities have to change in size, but they have to change in types to meet the ever-changing industrial requirements. To keep abreast of the needs, researchers are busy. U. S. Steel Corp. has more than 100 new steels or new applications under study. Pittsburgh Steel Co. is looking at the stainless steel business so it can expand into that field if it wishes.

QUICK REWARD—The steel industry's confidence in the future is being rewarded quickly with a good volume of business. It's good enough to support an ingot production rate of 80.5 per cent of the enlarged capacity in the week ended Jan. 9. Figured on the 1954 capacity, the rate would be 82.5 per cent. Weekly capacity is now 2,413,278 tons. Last year it was 2,348,549 tons. Yield in the week ended Jan. 9 was 1,943,000 tons of raw steel.

PRICE TRENDS—The quickened pace of domestic steel production along with export demand for scrap pushed STEEL's price composite on steelmaking grades of scrap to $34.50 a gross ton from the preceding week's $32.83. The new level is the highest since November, 1953. Although producers continue to adjust prices upward on alloy and stainless steels to compensate for increases in nickel and molybdenum prices, STEEL's price composite on finished steel remains at $117.95 a net ton.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Jan. 9	Change	Same Week 1954	Same Week 1953
Pittsburgh	77.5	+ 3*	89.5	105.5
Chicago	85.5	+ 2*	80.5	106.5
Mid-Atlantic	72	+ 2	82	100
Youngstown	86	+ 1	80	106
Wheeling	94.5	+11.5	82	101
Cleveland	95.5	— 2.5*	86.5	98
Buffalo	100	0	78	106.5
Birmingham	74.5	+ 7.5	95	108
New England	74	+ 4	75	89
Cincinnati	72.5	— 1.5	71	93
St. Louis	78.5	+ 4*	73	93
Detroit	83	+ 2.5*	93	104
Western	73	+ 4	80.5	108
National Rate	80.5	+ 1.5*	75	98

INGOT PRODUCTION‡

	Week Ended Jan. 9	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	121.0†	115.2	121.9	111.9
NET TONS (In thousands)	1,943†	1,850	1,958	1,798

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,413,278 in 1955; 2,384,549 in 1954; 2,254,459 in 1953.

Metalworking Outlook—p. 19 Technical Outlook—p. 61

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Jan. 4 1955	Dec. 28 1954	Month Ago	Dec. Average
(1947-1949=100)	144.7	144.7	144.7	144.7

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Jan. 4

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.525
Rails, light, 40 lb	5.917
Tie Plates	5.275
Axles, railway	7.560
Wheels, freight car, 33 in. (per wheel)	48.500
Plates, carbon	4.675
Structural Shapes	4.517
Bars, tool steel, carbon (lb)	0.430
Bars, tool steel, alloy, oil hardening die (lb)	0.525
Bars, tool steel, H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C .060 (lb)	1.115
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.610
Bars, H.R., alloy	6.775
Bars, H.R., stainless, 302 (lb)	0.423
Bars, H.R., carbon	5.000
Bars, reinforcing	5.050
Bars, C.F., carbon	6.160
Bars, C.F., alloy	11.275
Bars, C.F., stainless, 302 (lb)	0.428
Sheets, H.R., carbon	4.870
Sheets, C.R., carbon	5.864
Sheets, galvanized	7.220
Sheets, C.R., stainless, 302 (lb)	0.553
Sheets, electrical	$9.350
Strip, C.R., carbon	7.493
Strip, C.R., stainless, 430 (lb)	0.415
Strip, H.R., carbon	5.113
Pipe, black, buttweld (100 ft)	15.000
Pipe, galv., buttweld (100 ft)	18.606
Pipe, line (100 ft)	146.804
Casing, oil well, carbon (100 ft)	154.216
Casing, oil well, alloy (100 ft)	227.875
Tubes, boiler (100 ft)	‡
Tubing, mechanical, carbon	‡
Tubing, mechanical, stainless, 304 (100 ft)	161.189
Tin plate, hot-dipped, 1.25 lb	8.533
Tin plate, electrolytic, 0.25 lb	7.233
Black plate, can making quality	6.333
Wire, drawn, carbon	7.938
Wire, drawn, stainless, 430 (lb)	0.545
Bale ties (bundle)	5.860
Nails, wire, 8d common	7.815
Wire, barbed (80-rod spool)	7.109
Woven wire fence (20-rod roll)	16.818

‡Not available.

STEEL's FINISHED STEEL PRICE INDEX*

	Jan. 5 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	194.53	194.53	194.53	189.74	156.13
Index in cents per lb	5.270	5.270	5.270	5.140	4.230

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$117.95	$117.95	$117.95	$113.91	$92.41
No. 2 Fdry, Pig Iron, GT	56.54	56.54	56.54	56.54	46.10
Basic Pig Iron, GT	56.04	56.04	56.04	56.04	45.60
Malleable Pig Iron, GT	57.27	57.27	57.27	57.27	47.27
Steelmaking Scrap, GT	34.50	32.63	32.58	29.67	26.83

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 120.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Jan. 5 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.30	4.30	4.30	4.15	3.45
Bars, H.R., Chicago	4.30	4.30	4.30	4.15	3.45
Bars, H.R., deld. Philadelphia	4.55	4.55	4.55	5.302	3.93
Bars, C.F., Pittsburgh	5.40	5.40	5.40	5.20	4.10-4.15
Shapes, Std., Pittsburgh	4.25	4.25	4.25	4.10	3.40
Shapes, Std., Chicago	4.25	4.25	4.25	4.10	3.40
Shapes, deld. Philadelphia	4.53	4.53	4.53	4.38	3.42
Plates, Pittsburgh	4.225	4.225	4.225	4.10	3.50
Plates, Chicago	4.225	4.225	4.225	4.10	3.50
Plates, Coatesville, Pa.	4.225	4.225	4.225	4.35	3.60
Plates, Sparrows Point, Md.	4.225	4.225	4.225	4.10	3.50
Plates, Claymont, Del.	4.225	4.225	4.225	4.55	3.60
Sheets, H.R., Pittsburgh	4.05	4.05	4.05	3.925	3.35
Sheets, H.R., Chicago	4.05	4.05	4.05	3.925	3.35
Sheets, C.R., Pittsburgh	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Chicago	4.95	4.95	4.95	4.775	4.00
Sheets, C.R., Detroit	5.10	5.10	5.10	4.975	4.20
Sheets, Galv., Pittsburgh	5.45	5.45	5.45	5.275	4.40
Strip, H.R., Pitts.	4.05	4.05	4.05	4.425	3.25
Strip, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Strip, C.R., Pittsburgh	5.75	5.75	5.75	5.45	4.15
Strip, C.R., Chicago	5.85	5.85	5.85	5.70	4.00-4.15
Strip, C.R., Detroit	5.90	5.90	5.90	5.45-6.05	4.20-.40
Wire, Basic, Pitts.	5.75	5.75	5.75	5.525	4.50
Nails, Wire, Pittsburgh	6.85	6.85	6.85	6.55	5.30
Tin plate (1.50 lb), box, Pitts.	$9.05	$9.05	$9.05	$8.95	$7.50
SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$75.00	$78.00	$78.00	$75.50	$63.00
Wire rods, ½-⅝" Pitts.	4.675	4.675	4.675	4.525	3.85
PIG IRON, Gross Ton					
Bessemer, Pitts.	$57.00	$57.00	$57.00	$57.00	$47.00
Basic, Valley	56.00	56.00	56.00	56.00	46.00
Basic, deld. Phila.	59.66	59.66	59.66	60.75	49.44
No. 2 Fdry, Pitts.	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Valley	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, deld. Phila.	55.16	55.16	55.16	61.25	49.94
No. 2 Fdry, Birm.	52.88	52.88	52.88	52.88	39.38
No. 2 Fdry (Birm.) deld. Cin.	60.38	60.38	60.38	60.43	46.06
Malleable, Valley	56.50	56.50	56.50	56.50	46.50
Malleable, Chicago	56.50	56.50	56.50	56.50	46.50
Ferromanganese, Duquesne	190.00†	190.00†	190.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pitts.	$36.50	$32.50	$32.50	$30.50	$30.00
No. 1 Heavy Melt, E. Pa.	32.00	32.00	32.25	29.50	23.50
No. 1 Heavy Melt, Chicago	35.00	34.00	33.00	29.00	27.00
No. 1 Heavy Melt, Valley	34.50	34.50	34.50	29.50	30.25
No. 1 Heavy Melt, Cleve.	33.00	32.50	32.50	28.75	27.25
No. 1 Heavy Melt, Buffalo	30.50	30.50	30.50	27.50	27.75
Rails, Rerolling, Chicago	53.00	53.00	52.50	39.50	39.50
No. 1 Cast, Chicago	40.00	40.00	39.50	32.50	38.50
COKE, Net Ton					
Beehive, Furn, Connisvl.	$13.75	$13.75	$13.75	$14.75	$13.25
Beehive Fdry, Connisvl.	16.75	16.75	16.75	16.75	15.50
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.00

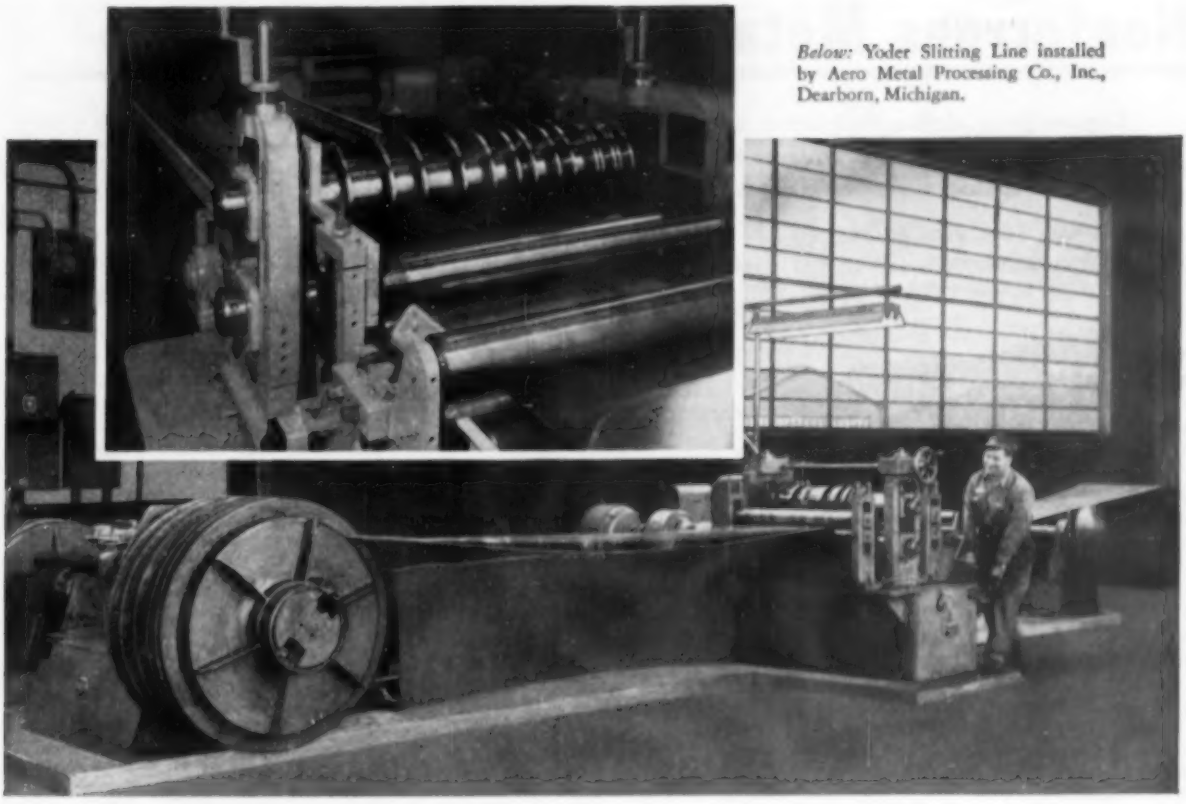
Daily Nonferrous Price Record

	Price Jan. 5	Last Change	Previous Price	Dec. Avg.	Nov. Avg.	Jan. 1954 Avg.
Copper	30.00	Apr. 12, 1954	29.75-30.00	30.000	30.000	29.750
Lead	14.80	Oct. 4, 1954	14.55	14.800	14.800	13.060
Zinc	11.50	Sept. 3, 1954	11.00	11.500	11.500	9.760
Tin	87.00	Jan. 5, 1955	87.125	88.649	91.196	85.100
Nickel	64.50	Nov. 24, 1954	60.00	60.900	60.000	60.000
Aluminum	22.20	Aug. 5, 1954	21.50	22.200	22.200	21.500
Magnesium	27.00	Mar. 9, 1953	24.50	27.000	27.000	27.000

Quotations in cents per pound based on: Copper, deld. Conn. Valley; Lead, common grade, deld. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, deld. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99+ %, deld.; Magnesium 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.**
  Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.**
  Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.**
  Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.**
  Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**



Below: Yoder Slitting Line installed by Aero Metal Processing Co., Inc., Dearborn, Michigan.

When is a Slitting Line Profitable?

● Many variables are to be considered in determining where and when a slitting line becomes a good investment. Also of what size, type, speed it should be, and other special features required to make it most profitable under any given set of conditions. Without obligation, a Yoder representative will call upon request and discuss such details with you.

The Yoder Slitter Book deals extensively with basic considerations in the choice and operation of slitting lines; points out, for instance, how and where a relatively small, inexpensive installation may be more economical than a larger, faster, and costlier one. (Yoder makes all types). Time studies show how coil size, strip gauge, slitter speed, coil handling and banding time affect cycle time and cost per ton.

The book is useful not only to present operators of slitting lines but to producers, users and distributors of strip and sheet metal who may be considering installing slitting equipment. A copy is yours for the asking.

THE YODER COMPANY
5502 Walworth Ave. • Cleveland 2, Ohio

Complete Production Lines

- ★ **COLD-ROLL-FORMING** and auxiliary machinery
- ★ **GANG SLITTING LINES** for Coils and Sheets
- ★ **PIPE and TUBE MILLS**—cold forming and welding

ENGINEERING YODER MANUFACTURING

Nonferrous Metals

Copper price defies its history by staying level for nearly two years. Big mine producers have been mainly responsible for taking guesswork out of the picture

Nonferrous Metal Prices, Pages 98 & 99

AN EFFECTIVE PRICE damper has been found for traditionally volatile copper.

In two years of freedom from price and use controls, the copper supply has varied from barrel-bottom scarcity to overflow. User demand has wandered high and low. The one thing that has held stable is the price.

Surprise — Never before have copper prices leveled for so long a period in a free market. Since February, 1953, domestic refinery prices for electrolytic copper haven't budged more than a fraction of a cent from the 30-cent peg. Except for war years, copper's price history had looked like a cross-section of the Rockies.

A source of embarrassment to the price prognosticators who have predicted a 20-30 per cent plunge with monotonous regularity, copper is likely to continue amazing industry with its constancy.

Producers' Control — Credit for damping the price swings goes to the big mine producers, who feel it's good business for fabricators and for themselves to take the guesswork out of price. Producers could have gotten a premium for their output in the fourth quarter but held the price line firmly. When oversupply threatened last year, they cut back operations temporarily rather than glut the market or reduce prices.

Fabricators learned last year not to clean their cupboards of copper waiting for a price break. Less speculative buying will be seen this year, primarily because of the tight immediate supply and strong demand both here and abroad. U. S. consumers are maintaining an order rate over 100,000 tons monthly and inventories are thin. Continued good business is a strong prop for 30-cent copper.

Big Additions—There's supply help coming for consumers from big new mine expansions now bearing fruit. By 1956, U. S. mine capacity alone will be more than a quarter-million tons higher than the 1953 level. New projects now operating (and their planned annual tonnage) include Copper Cities, Ariz. (22,500 tons), Greater Butte Project, Mont. (45,000 tons), Kimberley Pit, Nev. (9000 tons), Lavender Pit, Ariz. (38,000 tons), Silver Bell, Ariz. (18,000 tons) and Yerington, Nev. (33,000 tons). Coming this year will be White Pine, Mich. (35,000 tons), Deep Ruth, Nev. (18,000 tons), Miami Extension, Ariz. (11,500 tons), Osceola Mine, Mich. (7000 tons). Last and biggest of the Korea-inspired expansions to open will be San Manuel, Ariz. (70,000 tons), which starts operations in 1956.

This extra metal won't millstone the price, though. Nearly all of it carries a government floor price guarantee, plus escalation for higher labor costs, etc., which have brought the floor to about 27.5 cents for much of that tonnage. Producers will be watching supply balance closely, and if the market is brimming with copper, 20 per cent of U. S. mine output in 1955-56 could go to the government. With these controls, copper men may have at last found the price stability required of a major industrial metal.

STEEL's Metal Price Averages for Dec., 1954
(Cents per pound)

Electrolytic Copper, del. Conn.	30.000
Lead, St. Louis	14.800
Prime Western Zinc, E. St. Louis	11.500
Straits Tin, New York	88.649
Primary Aluminum Ingots, del.	22.200
Magnesium, Freeport, Tex.	27.000
Nickel, f.o.b. refinery	64.500

Rhodesia Stirs Copper Pot

New labor fires keep the copper pot boiling. Strikes in Northern Rhodesian mines last week, accounting for some 35,000 tons of red metal monthly, threw a pall over consumers just recovering from last fall's strikes in the U. S. and Chile. Year-end buying to build depleted inventory for tax purposes also added market tautness. Sensitive scrap prices advanced quickly following the strike news. Rhodesia last year passed Chile as the world's second-largest copper producer. The strikes are essentially an uprising in the native population to get rights. One Rhodesian company recently startled U. S. copper men by declaring that half the world's copper was mined at lower cost than that of Rhodesian metal (about 17.5 cents), exploding the common belief that the African mines were lowest-cost producers.

BDSA: Happy New Year to Metal

A happy new year is in store for sellers of aluminum, copper and tin, according to a Business & Defense Services Administration survey. BDSA predicts civilian shipments of aluminum will surpass record 1954. Total shipments will run 1.6 million tons—150,000 tons above 1954 and about the 1953 level. Far higher civilian consumption is expected to more than make up for defense decreases. The copper outlook is predicted at "moderately above 1954," with high activity in construction and durable goods manufacture, plus stabilized military procurement showing the way. The agency foresees a tin consumption 5 per cent over the estimated 56,000 tons used in 1954 and anticipates ratification of the International Tin Agreement.

Market Memos

- Stepping into the aluminum foil market through the front door, Revere Copper & Brass Inc. bought assets of Standard Rolling Mills Inc. The company, which also rolls lead and tin foil, is expected to add $7.5 million to Revere sales and further extend Revere's range of aluminum products.
- Collapsible tubes mean business for metals men. Last year nearly a billion tubes were produced, using 19 million lb of lead, 6.16 million lb of aluminum and 1.25 million lb of tin.
- Watch for general price reductions on cold-rolled beryllium copper strip. Quantity discounts are being offered in lighter gages.
- Fine-grained phosphor bronzes featuring good fatigue life and formability at no sacrifice in yield strength or proportional limit will be marketed by American Brass Co. under the name Duraflex.
- Upsurge in selenium use for rectifiers sent the price kiting Jan. 1 to $7.25 per pound at the consumer level, up $1.50 per pound.
- Predictions of 1955 shipments at the 1953 level by electrical manufacturers is heartening to metals men, particularly wiremakers. In 1954, shipments hit $15.6 million, and next year a 5-per-cent increase is expected.

You call ONE MAN . . . not a "bored meeting" when you order Bristol Brass

YOU don't have to "go down the line" . . . and back over it again and again . . . when you do business with Bristol. You deal with one man all the way . . . one man who has both the mill experience and sales know-how to speed your order straight through. You won't get the "I don't know but I'll ask someone who does and have him call you back" treatment. Whoever talks to you at Bristol has the full authority and responsibility to get your Brass to you quickest way. Nor does he have to be a vice president!

And once your specifications are set in the mill, your interests are protected by the personal interest which Bristol mill men will take in your orders. You're not an order number . . . you're a recognized individual . . . and we're not too big to forget it.

So all you have to do when you call Bristol (Connecticut) Ludlow 3-9246 is simply to say: "I want to place an order". And the next voice you hear will be that of the man who'll take it from there to your receiving department.

The Bristol Brass Corporation has been making Brass strip, rod and wire here in Bristol, Connecticut since 1850, and has offices and warehouses in Albany, Boston, Buffalo, Chicago, Cleveland, Detroit, Milwaukee, New York, Philadelphia, Providence, Rochester, Syracuse. The Bristol Brass Corporation of California, 1217 East 6th St., Los Angeles 21. The Bristol Brass Corporation of Ohio, 1607 Broadway, Dayton.

And now . . . BRASS FORGINGS, too . . .
The Bristol Brass Corporation announces the acquisition of Accurate Brass Company, 73rd Ave. & 88th St., Brooklyn 27, N.Y.
"How do you know it can't be forged?"

"Bristol-Fashion" means **Brass at its Best**

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots 22.20, pigs 20.50 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 13% Si, 24; No. 43, 5% Si, 23.5; No. 142, 4% Cu, 25.1; No. 195, 4.5% Cu, 0.8% Si, 24.5; No. 214, 3.8% Mg, 25.3; No. 356, 7% Si, 0.3% Mg, 23.9.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.; Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg; $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 30.00 deld. Conn. Valley, 30.00 deld. Midwest; Lake 30.00 deld; Fire refined 29.75 deld.

Germanium: 99.9%, $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Iadium: 99.9%, $2.25 per troy oz.

Iridium: $110-$120 nom. per troy oz.

Lead: Common 14.80, chemical 14.90, corroding 14.90, St. Louis; N. Y. basis, add 0.20.

Lithium: 98%, $10-$14 per lb, depending on quantity.

Magnesium: 99.8%, self-palletizing pig 27.00; notched ingot 27.75, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., and Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks 1.3 in. diameter, 46.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more, f.o.b. Freeport, Tex., or Madison, Ill. Add 1.30 for Port Newark, N. J.

Mercury: Open market, spot, New York, $322-$325, per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.00 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 64.50; 10-lb pigs, unpacked 67.63; "XX" nickel shot 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty, New York basis, add 0.92.

Osmium: $120-$130 nom. per troy oz.

Palladium: $18-$20 per troy oz.

Platinum: $81-$84 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $120-$125 per troy oz.

Ruthenium: $50-$55 per troy oz.

Selenium: 99.5%, $6-$7.25 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $39.00 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot 87.00, prompt 87.00.

Titanium: Sponge, 99.3 + %, grade A-1 ductile (0.3% Fe max) $4.50, grade A-2 (0.5% Fe max) $4 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $4.95 per lb nom., f.o.b. shipping point; less than 1000 lb $5.10 nom.; 99 + % hydrogen reduced, $4.65. Treated ingots $6.70.

Zinc: Prime Western 11.50, brass special 11.75, intermediate 12.00, E. St. Louis, freight allowed over 0.50 per pound. High grade 12.85, special high grade 13.00, die casting alloy ingot 15.50, deld.

Zirconium: Sponge $10 per lb; powder electronics grade $16, flash grade $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloy 21.75-22.75; No. 12 foundry alloy (No. 2 grade) 21.25-21.75; 5% silicon alloy, 0.60 Cu max., 23.50-23.75; 13 alloy 0.60 Cu max., 23.50-23.75; 195 alloy 22.00-23.50; 108 alloy 21.75-22.00; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 21.75-22.50; grade 2, 20.75-21.75; grade 3, 20.25-20.50; grade 4, 19.25-19.75.

Brass Ingot: Red brass, No. 115, 30.00; tin bronze No. 225, 41.00; No. 245, 34.75; high-leaded tin bronze, No. 305, 34.00; No. 1 yellow, No. 405, 25.75; manganese bronze No. 421, 27.75.

Magnesium Alloy Ingot: AZ63A, 31.00; AZ91B, 26.00; AZ91C, 31.00; AZ92A, 31.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.66; rod, bar, wire, $1.65.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb, 36.28; 30,000 lb, 36.53; l.c.l. 37.03. Magnet wire deld., 15,000 lb or more 41.83; l.c.l. 42.55.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more $20.00 per cwt; pipe, full coils $20.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $11; forging billets $9; hot-rolled and forged bars, $9.

ZINC

(Prices per lb c.l., f.o.b. mill) Sheets 23.00; ribbon zinc in coils, 18.50-20.50; plates 18.00-22.25.

ZIRCONIUM

Plate $37; H.R. strip $28; C.R. strip $35; forged or H.R. bars $27; wire, 0.015 in., 1 cent per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	102	78	99
Strip, C.R.	102	87	125
Plate, H.R.	97	83	95
Rod, Shapes H.R.	87	69	93
Rod, Shapes C.R.	91	75	115
Seamless Tubes	123	108	153
Shot, Blocks	...	65	...

ALUMINUM*

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	42.5	41.0	...	...
0.156-0.172	42.9	41.3	...	...
0.188	42.9	41.3	...	45.6
0.219-0.234	50.1	48.5	...	...
0.250-0.281	50.1	48.5	...	42.7
0.313	50.1	48.5	...	39.6
Cold-Finished				
0.375-0.547	48.9	46.5	55.9	52.2
0.563-0.688	48.9	46.5	55.9	52.7
0.750-1.000	47.7	45.3	51.1	49.4
1.063	47.7	45.3	...	47.9
1.125-1.500	45.9	43.6	49.4	47.9
Rolled				
1.563	44.7	42.4	...	...
1.625-2.000	44.1	41.8	...	46.2
2.125-2.500	43.0	40.7	...	...
2.563-3.375	41.7	39.5	...	...

ALUMINUM*

Sheets and Circles: 1100 and 3003 mill finish c.l. (30,000 lb base; freight allowed over 400 lb)

Thickness Range Inches	Widths or Diameters, In., Ins.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	12-49	34.9	...	...
0.135-0.096	12-48	35.4	...	...
0.095-0.077	12-48	36.1	33.6	35.6
0.076-0.061	12-48	36.7	33.8	38.8
0.060-0.048	12-48	37.2	34.1	39.2
0.047-0.038	12-48	37.7	34.6	39.8
0.037-0.030	12-48	38.1	35.0	40.3
0.029-0.024	12-48	38.7	35.3	40.8
0.023-0.019	12-36	39.4	36.1	41.6
0.018-0.017	12-36	40.2	36.7	42.5
0.016-0.015	12-36	41.1	37.5	43.7
0.014	12-24	42.1	38.5	45.0
0.013-0.012	12-24	43.3	39.2	46.0
0.011	12-24	44.3	40.4	47.6
0.010-0.0095	12-24	45.5	41.5	49.2
0.009-0.0085	12-24	46.8	43.0	51.3
0.008-0.0075	12-24	48.4	44.2	53.1
0.007	12-18	49.9	45.7	55.4
0.006	12-18	51.5	47.1	60.4

*72-180 in. lengths. †26 in. max. dia.

ALUMINUM*

Plates and Circles: Thickness 0.250-3.0 in. 24-60 in. width or dia, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	34.7	38.9
5050-F	34.7	38.9
3004-F	35.7	40.8
5052-F	37.4	42.4
6061-T6	38.6	43.0
2024-T4*	40.8	46.9
7075-T6*	48.6	55.2

*24-45 in. widths or dia., 72-180 in. lengths.

ALUMINUM*

Forging Stock: Round, Class 1, 46.8-36.3, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 52.6-40 in. random lengths 0.375-4.0 in. thick, widths 0.750-10 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size in.		Nom. pipe Size, in.	
⅜	$515.70	2	$ 48.30
1	24.75	4	132.90
1¼	23.50	6	238.35
1½	40.05	8	358.80

*Alloy designations are standard for use on and after Oct. 1, 1954. To relate them to designations used prior to that time, see STEEL, Aug. 9, 1954, p. 95.

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 94.00, 0.064-in. 73.00, 0.125-in. 60.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot rolled AZ31, 53.00, 20,000 lb or more 0.250-in. and over widths to 48 in., lengths to 144 in.; raised pattern floor plate, 59.00, 20,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings 14.50; low copper clippings 14.50; mixed clippings 12.50; old sheet 11.00; borings and turnings 7.50; pistons and struts 8.00; crankcases 11.00; industrial castings 11.00.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	45.76b	46.36c	....	48.82	26.000	26.000	25.250
Yellow Brass	42.27	42.21d	42.31	45.18	19.875	19.625	18.250
Red Brass, 85%	45.99	45.83	46.49	48.70	23.000	22.750	22.250
Low Brass, 80%	44.95	44.80	45.49	47.76	22.250	22.000	21.500
Naval Brass	46.39	46.70	53.43	49.56	18.500	18.250	17.750
Commercial Bronze, 90%	47.38	47.32	47.92	49.94	23.875	23.625	23.125
Nickel Silver, 10%	56.30	60.66g	58.63	....	24.125	23.875	12.063
Phosphor Bronze, A, 5%	67.31	67.51	67.51	66.96	26.500	26.250	25.250
Silicon Bronze	53.09	52.26	53.13	70.49e	25.125	24.875	24.125
Manganese Bronze	50.09	44.25	54.70	....	18.500	18.250	17.750
Munts Metal	44.54	40.35	....	....	18.750	18.500	18.000

a. Cents per lb f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Copper and Brass: Heavy copper and wire No. 1 27.00-27.50; No. 2 copper 25.50-26.00; light copper 23.50-24.00; No. 1 composition red brass 21.00; No. 1 composition turnings 20.50; mixed brass turnings 14.00; new brass clippings 18.00; No. 1 brass rod turnings 15.00; light brass 12.50; heavy yellow brass 15.50; new brass rod ends 16.00; auto radiators, unsweated 17.00; cocks and faucets 17.00; brass pipe 17.50.

Lead: Heavy 11.75-12.00; battery plate 6.25-6.50; linotype and stereotype 13.75-14.00; electrotype 12.00-12.50; mixed babbitt 12.50-13.00.

Magnesium: Clippings 18.50-19.50; clean castings 17.50-18.50; iron castings, not over 10% removable Fe, 15.50-16.50.

Monel: Clippings 23.00-25.00; old sheet 21.00-23.00; turnings 16.00-18.00; rods 23.00-25.00.

Nickel: Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 55.00-60.00; block tin pipe 75.00-80.00; No. 1 babbitt 50.00.

Zinc: Old zinc, 5.00-5.25; new die cast scrap, 4.75-5.00; old die cast scrap, 3.25-3.50.

REFINER'S BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings 16.00-17.00; 3003 clippings 16.00-16.75; 6151 clippings 16.00-16.75; 5052 clippings 16.00-17.00; 2014 clippings 15.00-15.75; 2017 clippings 15.00-15.75; 2024 clippings 15.00-15.75; mixed clippings 14.25-15.25; old sheet 14.00-14.75; old cast 13.75-14.75; clean old cable (free of steel) 15.75-16.25; borings and turnings 14.25-14.75.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 29.50; No. 2 copper 28.00; light copper 26.50; refinery brass (60% copper) per dry copper content 26.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 29.50; No. 2 copper 28.00; light copper 26.50; No. 1 composition borings 23.25; No. 1 composition solids 23.50; heavy yellow brass solids 18.00-18.25; yellow brass turnings 17.00-17.25; radiators 19.00.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.70 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 5000-10,000 lb; electrodeposited 39.78, cast 42.04, 2000-5000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less thtn 200 lb $1.055; 200-499 lb $1.04; 500-999 lb $1.035; 1000 lb or more $1.03.

Zinc: Bar 20.00, bar or flat top 19.00 ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.

Copper Cyanide: Under 1000 lb 63.90; 1000 lb and over 61.90.

Copper Sulphate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 25,000 oz and over 77.325.

Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb 68.2; 100-600 lb 54.1; 700-1900 lb 51.6; 2000-9900 lb 49.8; 10,000 lb or more 48.7.

Stannous Chloride (Anhydrous): Less than 50 lb $1.533; 50 lb $1.193; 100-300 lb $1.043; 400-900 lb $1.019; 1000-1900 lb 99.4; 2000-4900 lb 95.8; 5000-19,000 lb 89.7; 20,000 lb and over 83.6.

Stannous Sulphate: Less than 5 lb $1.235; 50 lb 93.5; 100-1900 lb 91.5; 2000 lb and over 89.5.

Zinc Cyanide: Under 1000 lb 54.30; 1000 lb and over 52.30.

KOPPERS

Aeromaster FANS ARE Granodized WITH GRANODINE®

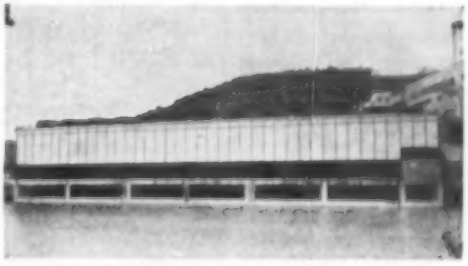
FOR EXTRA PROTECTION

KOPPERS Precision-Engineered Air Delivery increases the efficiency of air flow in industrial cooling systems. Basic element is the Aeromaster Fan, and this unit is operated continuously, sometimes under severe conditions. Dependable, efficient operation is a "must"

"Granodine" application on welded 54" Hub for Aeromaster 6-bladed 22-foot Cooling Tower Fan.

KOPPERS uses "Granodine" No. 50 to coat the 54-inch diameter hub of the 22-foot diameter fan shown above. "Granodine" phosphate coatings provide a "tooth" for adhesion of subsequent finishes and protect the underlying metal so that rust will not spread if these finishes are cracked or nicked.

"Granodine"® anchors the finish.



Aeromaster 22-foot Fans provide continuous air flow in C. H. Wheeler Cooling Tower at Pennsylvania Electric Company's Shawville Station, Pennsylvania

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AMERICAN CHEMICAL PAINT COMPANY

CHEMICALS ACP PROCESSES

General Offices: Ambler, Penna.

CHEMICALS ACP PROCESSES

Detroit, Michigan **Niles, California** **Windsor, Ontario**

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; Key on page 101. Key to footnotes, page 103.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 ....$61.50

INGOTS, Alloy (NT)

Detroit R7 ....$65.00
Houston 55 ....70.00
Midland,Pa. C18 ....65.00
Munhall,Pa. U5 ....65.00

BILLETS, BLOOMS & SLABS

Carbon, Rerolling (NT)

Aliquippa,Pa. J5 ....$64.00
Bessemer,Pa. U5 ....64.00
Buffalo R2 ....64.00
Clairton,Pa. U5 ....64.00
Ensley,Ala. T2 ....64.00
Fairfield,Ala. T2 ....64.00
Fontana,Calif. K1 ....72.00
Gary,Ind. U5 ....64.00
Johnstown,Pa. B2 ....64.00
Lackawanna,N.Y. B2 ..64.00
Munhall,Pa. U5 ....64.00
Pittsburgh J5 ....64.00
So.Chicago,Ill. R2, U5..64.00
So.Duquesne,Pa. U5 ...64.00
Youngstown R3 ....64.00

Carbon, Forging (NT)

Aliquippa,Pa. J5 ....$78.00
Bessemer,Pa. U5 ....78.00
Buffalo R2 ....78.00
Canton,O. R2 ....80.00
Clairton,Pa. U5 ....78.00
Conshohocken,Pa. A3 ..83.00
Ensley,Ala. T2 ....78.00
Fairfield,Ala. T2 ....78.00
Fontana,Calif. K1 ....86.00
Gary,Ind. U5 ....78.00
Geneva,Utah C11 ....78.00
Houston 55 ....87.00
Johnstown,Pa. B2 ....78.00
Lackawanna,N.Y. B2 ..78.00
LosAngeles B3 ....87.50
Midland,Pa. C18 ....78.00
Munhall,Pa. U5 ....78.00
Pittsburgh J5 ....78.00
Seattle B3 ....91.50
So.Chicago R2,U5,W14..78.00
So.Duquesne,Pa. U5 ...78.00
So.SanFrancisco B3 ...87.50

Alloy, Forging (NT)

Bethlehem,Pa. B2 ....$86.00
Buffalo R2 ....86.00
Canton,O. R2, T7 ....86.00
Conshohocken,Pa. A3 ..93.00
Detroit R7 ....86.00
Fontana,Calif. K1 ....105.00
Gary,Ind. U5 ....86.00
Houston 55 ....91.00
Ind.Harbor,Ind. Y1 ...86.00
Johnstown,Pa. B2 ....86.00
Lackawanna,N.Y. B2 ..86.00
LosAngeles B3 ....106.00
Massillon,O. R2 ....88.00
Midland,Pa. C18 ....86.00
Munhall,Pa. U5 ....86.00
So.Chicago, R2,U5,W14..86.00
So.Duquesne,Pa. U5 ...86.00
Struthers,O. Y1 ....86.00
Warren,O. C17 ....86.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 ....$96.50
Canton,O. R2 ....96.50
Cleveland R2 ....96.50
Gary,Ind. U5 ....96.50
So.Chicago R2, W14 ..96.50
So.Duquesne,Pa. U5 ...96.50

SKELP

Aliquippa,Pa. J5 ....4.00
Fontana,Calif. K1 ....4.775
Munhall,Pa. U5 ....3.90
SparrowsPoint,Md. B2 ..3.90
Warren,O. R2 ....3.90
Youngstown R2, U5 ....3.90

WIRE RODS

AlabamaCity,Ala. R2 ..4.675
Aliquippa,Pa. J5 ....4.675
Alton,Ill. L1 ....4.85
Buffalo B11, W12 ....4.675
Cleveland A7 ....4.675
Donora,Pa. A7 ....4.675
Fairfield,Ala. T2 ....4.675
Fontana,Calif. K1 ....5.475
Houston 55 ....4.925
IndianaHarbor,Ind. Y1 .4.675
Johnstown,Pa. B2 ....4.675
Joliet,Ill. A7 ....4.675
KansasCity,Mo. 55 ....4.925
Kokomo,Ind. C16 ....4.775
LosAngeles B3 ....5.475
Minnequa,Colo. C10 ...4.925
Monessen,Pa. P7 ....4.675
No.Tonawanda,N.Y.B11 4.675
Pittsburg,Calif. C11 ...5.325
Portsmouth P12 ....4.675
Roebling,N.J. R5 ....4.775
So.Chicago,Ill. R2 ....4.675
SparrowsPoint,Md. B2..4.775
Sterling,Ill.(1) N15 ....4.675
Sterling,Ill. N15 ....4.775
Struthers,O. Y1 ....4.675
Torrance,Calif. C11 ...5.475
Worcester,Mass. A7 ...4.975

STRUCTURALS

Carbon Steel Stand. Shapes

Ala.City,Ala. R2 ....4.25
Aliquippa,Pa. J5 ....4.25
Bessemer,Ala. T2 ....4.25
Bethlehem,Pa. B2 ....4.30
Birmingham C15 ....4.25
Clairton,Pa. U5 ....4.25
Fairfield,Ala. T2 ....4.25
Fontana,Calif. K1 ....4.90
Gary,Ind. U5 ....4.25
Geneva,Utah C11 ....4.25
Houston 55 ....4.30
Ind.Harbor,Ind. I-2 ...4.25
Johnstown,Pa. B2 ....4.30
KansasCity,Mo. 55 ....4.30
Lackawanna,N.Y. B2 ...4.30
LosAngeles B3 ....4.95
Minnequa,Colo. C10 ...4.70
Munhall,Pa. U5 ....4.25
Niles,Calif. P1 ....4.90
Phoenixville,Pa. P4 ....3.95
Portland,Oreg. O4 ....5.00
Seattle B3 ....5.00
So.Chicago U5, W14 ...4.25
So.SanFrancisco B3 ...4.90
Torrance,Calif. C11 ...4.95
Weirton,W.Va. W6 ....4.25

Wide Flange

Bethlehem,Pa. B2 ....4.30
Clairton,Pa. U5 ....4.25
Fontana,Calif. K1 ....5.25
Lackawanna,N.Y. B2 ..4.30
Munhall,Pa. U5 ....4.25
Phoenixville,Pa. P4 ....3.95
So.Chicago,Ill. U5 ....4.25

Alloy Stand. Shapes

Clairton,Pa. U5 ....5.20
Fontana,Calif. K1 ....6.60
Gary,Ind. U5 ....5.20
Houston 55 ....5.45
Munhall,Pa. U5 ....5.20
So.Chicago,Ill. U5 ....5.20

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5 ....6.40
Bessemer,Ala. T2 ....6.40
Bethlehem,Pa. B2 ....6.45
Clairton,Pa. U5 ....6.40
Fairfield,Ala. T2 ....6.40
Fontana,Calif. K1 ....7.05
Gary,Ind. U5 ....6.40
Geneva,Utah C11 ....6.40
Houston 55 ....6.45
Ind.Harbor,Ind. I-2, Y1.6.40
Johnstown,Pa. B2 ....6.45
KansasCity,Mo. 55 ....6.45
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 ....7.10
Munhall,Pa. U5 ....6.40
Seattle B3 ....7.15
So.Chicago,Ill. U5, W14..6.40
So.SanFrancisco B3 ...7.05
Struthers,O. Y1 ....6.40

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 ....6.45
Lackawanna,N.Y. B2 ..6.45
Munhall,Pa. U5 ....6.40
So.Chicago,Ill. U5 ....6.40

PILING

BEARING PILES

Munhall,Pa. U5 ....4.25
So.Chicago,Ill. U5 ....4.25

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 ...5.075
Lackawanna,N.Y. B2 ..5.075
Munhall,Pa. U5 ....5.075
So.Chicago,Ill. U5 ....5.075

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 ....4.225
Aliquippa,Pa. J5 ....4.225
Ashland,Ky.(15) A10 ..4.225
Bessemer,Ala. T2 ....4.225
Buffalo R2 ....4.225
Clairton,Pa. U5 ....4.225
Claymont,Del. C22 ....4.225
Cleveland J5, R2 ....4.225
Coatesville,Pa. L7 ....4.225
Conshohocken,Pa. A3 ..4.225
Ecorse,Mich. G5 ....4.325
Fairfield,Ala. T2 ....4.225
Fontana,Calif.(30) K1..4.875
Gary,Ind. U5 ....4.225
Geneva,Utah C11 ....4.225
GraniteCity,Ill. G4 ....4.425
Harrisburg,Pa. C5 ....3.975
Houston 55 ....4.275
Ind.Harbor,Ind. I-2, Y1.4.225
Johnstown,Pa. B2 ....4.225
Lackawanna,N.Y. B2 ..4.225
LoneStar, Tex. L6 ....4.55
Mansfield,O. E6 ....4.225
Minnequa,Colo. C18 ...5.075
Munhall,Pa. U5 ....4.225
Newport,Ky. N9 ....4.225
Pittsburgh J5 ....4.225
Riverdale,Ill. A1 ....4.225
Seattle B3 ....5.125
Sharon,Pa. S3 ....4.225
So.Chicago,Ill. R2 ....4.225
So.Chicago,Ill. U5,W14..4.225
SparrowsPoint,Md. B2..4.225
Steubenville,O. W10 ...4.225
Warren,O. R2 ....4.225
Weirton,W.Va. W6 ....4.225
Youngstown R2,U5,Y1..4.225

PLATES, Carbon Abras. Resist.

Fontana,Calif. K1 ....6.025
Geneva,Utah C11 ....5.375

PLATES, Wrought Iron

Economy,Pa. B14 ....9.80

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5 ....6.45
Bessemer,Ala. T2 ....6.45
Clairton,Pa. U5 ....6.45
Cleveland J5, R2 ....6.45
Conshohocken,Pa. A3 ..6.45
Ecorse,Mich. G5 ....6.55
Fairfield,Ala. T2 ....6.45
Fontana,Calif.(30) K1 ..7.15
Gary,Ind. U5 ....6.45
Geneva,Utah C11 ....6.45
Houston 55 ....6.50
Ind.Harbor,Ind. I-2, Y1.6.45
Johnstown,Pa. B2 ....6.45
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 ....7.35
Munhall,Pa. U5 ....6.45
Pittsburgh J5 ....6.45
Seattle B3 ....7.35
Sharon,Pa. S3 ....6.45
So.Chicago,Ill. U5, W14.6.45
SparrowsPoint,Md. B2 ..6.45
Youngstown U5, Y1 ....6.45

PLATES, Alloy

Claymont,Del. C22 ....5.80
Coatesville,Pa. L7 ....5.80
Fontana,Calif. K1 ....6.45
Gary,Ind. U5 ....5.80
Houston 55 ....5.85
Ind.Harbor,Ind. Y1 ....5.80
Johnstown,Pa B2 ....5.80
Munhall,Pa. U5 ....5.80
Newport,Ky. N9 ....5.80
Seattle B3 ....6.70
Sharon,Pa. S3 ....5.80
So.Chicago,Ill. U5, W14.5.80
SparrowsPoint,Md. B2 ..5.80
Youngstown Y1 ....5.80

FLOOR PLATES

Cleveland J5 ....5.275
Conshohocken,Pa. A3 ..5.275
Harrisburg,Pa. C5 ....5.15
Ind.Harbor,Ind. I-2 ...5.275
Munhall,Pa. U5 ....5.275
So.Chicago,Ill. U5 ....5.275

PLATES, Ingot Iron

Ashland c.l. (15) A10..4.475
Ashland l.c.l. (15) A10.4.975
Cleveland c.l. R2 ....4.825
Warren,O. c.l. R2 ....4.825

BARS

BARS, Hot-Rolled Carbon

Ala.City,Ala. R2 ....4.30
Aliquippa,Pa. J5 ....4.30
Alton,Ill. L1 ....4.50
Atlanta,Ga. A11 ....4.50
Bessemer,Ala. T2 ....4.30
Birmingham C15 ....4.30
Buffalo R2 ....4.30
Canton,O. R2 ....4.40
Clairton,Pa. U5 ....4.30
Cleveland R2 ....4.30
Ecorse,Mich. G5 ....4.40
Emeryville,Calif. J7 ....5.05
Fairfield,Ala. T2 ....4.30
Fairless,Pa. U5 ....4.45
Fontana,Calif. K1 ....5.00
Gary,Ind. U5 ....4.30
Houston 55 ....4.55
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 ....4.30
KansasCity,Mo. 55 ....4.55
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 ....5.00
Massillon,O. R2 ....4.40
Midland,Pa. C18 ....4.30
Milton,Pa. M18 ....4.30
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 ....5.00
N.Tonawanda,N.Y. B11..4.30
Pittsburg,Calif. C11 ....5.00
Pittsburgh J5 ....4.30
Portland,Oreg. O4 ....5.05
Seattle B3, N14, P23 ....5.05
So.Chicago, R2,U5,W14..4.30
So.Duquesne,Pa. U5 ....4.30
So.SanFran.,Calif. B3 ..5.05
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 ....4.40
Struthers,O. Y1 ....4.30
Torrance,Calif. C11 ....5.00
Warren,O. R2 ....4.30
Weirton,W.Va. W6 ....4.30
Youngstown R2, U5 ....4.30

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 ....5.075
Buffalo R2 ....5.075
Canton,O. R2, T7 ....5.075
Clairton,Pa. U5 ....5.075
Detroit R7 ....5.075
Ecorse,Mich. G5 ....5.175
Fontana,Calif. K1 ....6.125
Fairless,Pa. U5 ....5.225
Gary,Ind. U5 ....5.075
Houston 55 ....5.325
Ind.Harbor,Ind. I-2, Y1..5.075
Johnstown,Pa. B2 ....5.075
KansasCity,Mo. 55 ....5.325
Lackawanna,N.Y. B2 ..5.075
LosAngeles B3 ....6.125
Massillon,O. R2 ....5.075
Midland,Pa. C18 ....5.075
So.Chicago R2, U5, W14 5.075
So.Duquesne,Pa. U5 ...5.075
Struthers,O. Y1 ....5.075
Warren,O. C17 ....5.075
Youngstown U5 ....5.075

BARS, H.R. Loaded Alloy

Warren,O. C17 ....5.625

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 ....6.45
Bessemer,Ala. T2 ....6.45
Bethlehem,Pa. B2 ....6.45
Clairton,Pa. U5 ....6.45
Cleveland R2 ....6.45
Ecorse,Mich. G5 ....6.55
Fairfield,Ala. T2 ....6.45
Fontana,Calif. K1 ....7.70
Gary,Ind. U5 ....6.45
Houston 55 ....6.70
Ind.Harb.,Ind. I-2, Y1...6.45
Johnstown,Pa. B2 ....6.45
KansasCity,Mo. 55 ....6.70
Lackawanna,N.Y. B2 ..6.45
LosAngeles B3 ....7.15
Pittsburgh J5 ....6.45
Seattle B3 ....7.20
So.Chicago W14 ....6.45
So.Duquesne,Pa. U5 ....6.45
So.SanFrancisco B3 ...7.20
Struthers,O. Y1 ....6.45
Warren,O. R2 ....6.45
Youngstown U5 ....6.45

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa. B2 ....4.45

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 ....4.30
Atlanta A11 ....4.50
Fontana,Calif. K1 ....5.00
Niles,Calif. P1 ....5.00
Pittsburgh J5 ....4.30
Portland,Oreg. O4 ....5.05
SanFrancisco B7 ....4.70

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5 ....5.20
Gary,Ind. U5 ....5.20
Houston 55 ....5.45
KansasCity 55 ....5.45
Youngstown U5 ....5.20

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ....5.40
BeaverFalls,Pa. M12, R2 5.40
Buffalo B5 ....5.45
Camden,N.J. P13 ....5.85
Carnegie,Pa. C12 ....5.40
Chicago W18 ....5.40
Cleveland A7, C20 ....5.40
Detroit R7 ....5.40
Detroit B5, P17 ....5.60
Donora,Pa. A7 ....5.40
Elyria,O. W8 ....5.40
FranklinPark,Ill. M5 ...5.40
Gary,Ind. R2 ....5.40
GreenBay,Wis. P7 ....5.40
Hammond,Ind. L2, M13 5.40
Hartford,Conn. R2 ....5.90
Harvey,Ill. B5 ....5.40
LosAngeles R2, S30 ....6.85
Mansfield,Mass. B5 ....5.95
Massillon,O. R2, R8 ....5.40
Midland,Pa. C18 ....5.40
Monaca,Pa. S17 ....5.40
Newark,N.J. W18 ....5.85
NewCastle,Pa.(17) B4 ..5.40
Pittsburgh J5 ....5.40
Plymouth,Mich. P5 ....5.65
Putnam,Conn. W18 ....5.95
Readville,Mass. C14 ....5.95
So.Chicago,Ill. W14 ....5.40
SpringCity,Pa. K3 ....5.85
Struthers,O. Y1 ....5.40
Waukegan,Ill. A7 ....5.40
Worcester,Mass. W19 ...5.85
Youngstown F3, Y1 ....5.40

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19..4.65

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ....6.625
BeaverFalls,Pa. M12,R2 6.625
Bethlehem,Pa. B2 ....6.625
Buffalo B5 ....6.625
Camden,N.J. P13 ....6.80
Canton,O. T7 ....6.625
Carnegie,Pa. C12 ....6.625
Chicago W18 ....6.625
Cleveland A7, C20 ....6.625
Detroit R7 ....6.625
Detroit B5, P17 ....6.825
Donora,Pa. A7 ....6.625
Elyria,O. W8 ....6.625
Gary,Ind. R2 ....6.625
GreenBay,Wis. P7 ....6.625
Hammond,Ind. L2, M13 6.625
Hartford,Conn. R2 ....6.925
Harvey,Ill. B5 ....6.625
Lackawanna,N.Y. B2 ..6.625
LosAngeles S30 ....8.30
Mansfield,Mass. B5 ....6.925
Massillon,O. R2, R8 ....6.625
Midland,Pa. C18 ....6.625
Monaca,Pa. S17 ....6.625
Newark,N.J. W18 ....6.80
Plymouth,Mich. P5 ....6.825
So.Chicago W14 ....6.625
SpringCity,Pa. K3 ....6.80
Struthers,O. Y1 ....6.625
Warren,O. C17 ....6.625
Waukegan,Ill. A7 ....6.625
Worcester,Mass. A7 ...6.925
Youngstown F3, Y1 ....6.625

BARS, C.F. Loaded Alloy

Camden,N.J. P13 ....7.70
Carnegie,Pa. C12 ....7.525
Cleveland C20 ....7.40
Monaca,Pa. S17 ....7.525
Newark,N.J. W18 ....7.70
SpringCity,Pa. K3 ....7.70
Warren,O. C17 ....7.525

BARS, Reinforcing (To fabricators)

Ala.City,Ala. R2 ....4.30
Atlanta A11 ....4.50
Birmingham C15 ....4.30
Buffalo R2 ....4.30
Cleveland R2 ....4.30
Emeryville,Calif. J7 ....5.05
Fairfield,Ala. T2 ....4.30
Fairless,Pa. U5 ....4.45
Fontana,Calif. K1 ....5.00
Ft.Worth,Tex.(42) T4 ...4.90
Gary,Ind. U5 ....4.30
Houston 55 ....4.55

Ind.Harbor, Ind. I-2, Y1 4.30
Johnstown, Pa. B2 ....4.30
Kansas City, Mo. S5 ....4.55
Lackawanna, N.Y. B2 ...4.30
Los Angeles B3 .....5.00
Milton, Pa. M18 .....4.30
Minnequa, Colo. C10 ....4.75
Niles, Calif. P1 .....5.00
Pittsburg, Calif. C11 ...5.00
Pittsburgh J5 .....4.20
Portland, Oreg. O4 .....5.05
Sand Springs, Okla. S5 ...4.80
Seattle B3, N14 P23 ..5.05
So. Chicago R2 .....4.30
So. Duquesne, Pa. U5 ....4.30
So. San Francisco B3 ....5.05
Sparrows Point, Md. B2 ..4.30
Sterling, Ill. (1) N15 ....4.30
Sterling, Ill. N15 .....4.40
Struthers, O. Y1 .....4.30
Torrance, Calif. C11 ....5.00
Youngstown R2, U5 ....4.30

BARS, Reinforcing
(Fabricated; to Consumers)

Johnstown, Pa., ¼-1" B2 5.70
Kansas City S5 .....6.50
Los Angeles B3 .....5.95
Marion, O. P11 .....5.55
Pittsburgh J5, U8 ....5.72
Seattle B3, N14, P23 ..6.15
So. San Francisco B3 ...6.00
Sparrows Pt. ¼-1" B2...5.70
Williamsport, Pa. S19 ..5.60

RAIL STEEL BARS

Avis, Pa. (3) J5 .....4.25
Chicago Hts. (3) C2, I-2, ..4.20
Chicago Hts. (4) C2, I-2, ..4.30
Ft. Worth, Tex. (26) T4 ..4.75
Franklin, Pa. (3) F5 ..4.20
Franklin, Pa. (4) F5 ..4.30
Marion, O. (3) P11 .....4.15
Moline, Ill. (3) R2 .....4.30
Tonawanda (3) B12 ....4.15
Tonawanda (4) B12 ....4.30
Williamsport, Pa. (3) S19 4.30

BARS, Wrought Iron

Economy, Pa. (S.R.) B14 10.85
Economy, Pa. (D.R.) B14 13.50
Economy (Staybolt) B14 13.80
McK.Rks (S.R.) L5 ...10.85
McK.Rks. (D.R.) L5 ..14.75
McK.Rks. (Staybolt) L5 16.25

SHEETS

SHEETS, Hot-Rolled Steel
(18 Gage and Heavier)

Ala. City, Ala. R2 .....4.05
Allenport, Pa. P7 .....4.05
Ashland, Ky. (8) A10 ...4.05
Cleveland J5, R2 .....4.05
Conshohocken, Pa. A3 ...4.10
Detroit (8) M1 .....4.20
Ecorse, Mich. G5 .....4.15
Fairfield, Ala. T2 .....4.05
Fairless, Pa. U5 .....4.10
Fontana, Calif. K1 ....4.825
Gary, Ind. U5 .....4.05
Geneva, Utah C11 .....4.15
Granite City, Ill. G4 ....4.25
Houston S5 .....4.30
Ind. Harbor, Ind. I-2, Y1 4.05
Irvin, Pa. U5 .....4.05
Kokomo, Ind. C16 .....4.15
Lackawanna, N.Y. B2 ..4.05
Mansfield, O. E6 (37) ...4.05
Mansfield, O. E6(38) ...4.80
Munhall, Pa. U5 .....4.05
Newport, Ky. N9 .....4.05
Niles, O. N12 .....4.05
Pittsburg, Calif. C11 ....4.75
Pittsburgh J5 .....4.05
Portsmouth, O. P12 .....4.05
Riverdale, Ill. A1 .....4.05
Sharon, Pa. S3 .....4.05
So. Chicago, Ill. W14 ....4.05
Sparrows Point, Md. B2 ..4.05
Steubenville, O. W10 ....4.05
Warren, O. R2 .....4.05
Weirton, W.Va. W6 ....4.05
Youngstown U5, Y1 ....4.05

SHEETS, H.R. (19 ga. lighter)

Ala. City, Ala. R2 .....5.35
Kokomo, Ind. C16 .....5.20
Niles, O. N12 .....4.95

SHEETS, H.R. Alloy

Ind. Harbor, Ind. Y1 ....5.80
Youngstown Y1 .....5.80

SHEETS, H.R. (14 ga. heavier)
High-Strength Low-Alloy

Cleveland J5, R2 .....6.10
Conshohocken, Pa. A3 ..6.15
Ecorse, Mich. G5 .....6.20
Fairfield, Ala. T2 .....6.10
Fairless, Pa. U5 .....6.15
Fontana, Calif. K1 ....6.875
Gary, Ind. U5 .....6.10
Ind. Harbor, Ind. I-2, Y1 6.10
Irvin, Pa. U5 .....6.10
Lackawanna (35) B2 ....6.10
Munhall, Pa. U5 .....6.10
Pittsburgh J5 .....6.10
Sharon, Pa. S3 .....6.10
So. Chicago, Ill. U5 .....6.10
Sparrows Point (36) B2 ..6.10
Warren, O. R2 .....6.10
Weirton, W.Va. W6 ....6.10
Youngstown U5, Y1 ....6.10

SHEETS, Hot-Rolled Ingot Iron
(18 Gage and Heavier)

Ashland, Ky. (8) A10 ....4.30
Cleveland R2 .....4.65
Ind. Harbor, Ind. I-2 ....4.30
Warren, O. R2 .....4.65

SHEETS, Cold-Rolled Steel
(Commercial Quality)

Allenport, Pa. P7 .....4.95
Cleveland J5, R2 .....4.95
Conshohocken, Pa. A3....5.00
Ecorse, Mich. G5 .....5.05
Fairfield, Ala. T2 .....4.95
Fairless, Pa. U5 .....5.00
Follansbee, W.Va. F4 ...4.95
Fontana, Calif. K1 .....6.05
Gary, Ind. U5 .....4.95
Granite City, Ill. G4 ....5.15
Ind. Harbor, Ind. I-2, Y1 4.95
Lackawanna, N.Y. B2 ..4.95
Middletown, O. A10 ....4.95
Pittsburg, Calif. C11 ....5.90
Pittsburgh J5 .....4.95
Portsmouth, O. P12 .....4.95
Sparrows Point, Md. B2..4.95
Warren, O. R2 .....4.95
Weirton, W.Va. W6 ....4.95
Youngstown Y1 .....4.95

SHEETS, Cold-Rolled
High-Strength Low-Alloy

Cleveland J5, R2 .....7.50
Ecorse, Mich. G5 .....7.60
Fairless, Pa. U5 .....7.55
Fontana, Calif. K1 .....8.55
Gary, Ind. U5 .....7.50
Indiana Harbor, Ind. Y1 ..7.50
Irvin, Pa. U5 .....7.50
Lackawanna (37) B1 ....7.50
Pittsburgh J5 .....7.50
Sparrows Point (38) B2 ..7.50
Warren, O. R2 .....7.50
Weirton, W.Va. W6 ....7.50
Youngstown Y1 .....7.50

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....5.55
Middletown, O. A10 ....5.45
Warren, O. R2 .....5.55

SHEETS, Culvert

(16 Ga.)	Cu Alloy	Cu Fe
Ashland, Ky.	A10 6.50	....
Canton, O.	R2 ...6.50	7.10
Fairfield	T2 ....5.70	....
Gary, Ind.	U5 ...5.70	5.95
Ind. Harbor	I-2 ..5.70	5.95
Irvin, Pa.	U5 ...5.70	....
Kokomo, Ind.	C16 5.80	....
Martins Frry., O.	W10 5.70	....
Newport, Ky.	N9 ..5.70	5.95
Pitts., Calif.	C11 ..6.45	....
Sparrows Pt.	B2 ..5.70	....

SHEETS, Culvert—Pure Iron

Ashland, Ky. A10 .....6.75
Gary, Ind. U5 .....5.95
Martins Ferry, O. W10 ..5.95

SHEETS, Galvanized Steel
Hot-Dipped

Ala. City, Ala. R2 .....5.45‡
Ashland, Ky. A10 .....5.45*
Butler, Pa. A10 .....5.45†
Canton, O. R2 .....5.45‡
Delphos, O. N16 .....6.10‡
Dover, O. R1 .....5.45‡
Fairfield, Ala. T2 ....5.45†
Gary, Ind. U5 .....5.45*
Granite City, Ill. G4 ....5.65‡
Ind. Harbor, Ind. I-2 ...5.45†
Irvin, Pa. U5 .....5.45†
Kokomo, Ind. C16 ....5.55‡
Martins Ferry, O. W10 ..5.45*
Middletown, O. A10 ....5.45†
Newport, Ky. N9 .....5.45†
Niles, O. N12 .....5.45‡
Pittsburg, Calif. C11 ..6.20*
Sparrows Pt., Md. B2 ..5.45‡
Weirton, W.Va. W6 ....5.45*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana, Calif. K1 ....6.325

SHEETS, Galvanized
High-Strength Low-Alloy

Irvin, Pa. U5 .....8.30
Sparrows Point (39) B2 ..8.30

SHEETS, Galvannealed Steel

Canton, O. R2 .....5.85
Irvin, Pa. U5 .....5.85
Kokomo, Ind. C16 ....5.95†
Newport, Ky. N9 .....5.85
Niles, O. N12 .....5.85

SHEETS, Galvanized Ingot Iron

Ashland, Ky. (8) A10 ....5.70
Canton, O. R2 .....6.20

SHEETS, Galvanized
Ingot Iron
(Hot-dipped Continuous)

Ashland, Ky. A10 .....5.70
Butler, Pa. A10 .....5.70
Middletown, O. A10 ....5.70

SHEETS, Electrogalvanized

Cleveland (28) R2 .....6.20
Niles, O. (28) R2 .....6.30
Weirton, W.Va. W6 ....6.15

SHEETS, Aluminum Coated

Butler, Pa. A10 .....8.625

SHEETS, Enameling Iron

Ashland, Ky. (8) A10 ...5.375
Cleveland R2 .....5.375
Gary, Ind. U5 .....5.375
Granite City, Ill. G4 ....5.675
Ind. Harbor, Ind. I-2 ...5.375
Irvin, Pa. U5 .....5.375
Middletown, O. A10 ....5.375
Niles, O. N12 .....5.375
Youngstown Y1 .....5.375

BLUED STOCK, 29 ga.

Follansbee, W.Va. F4 ..7.375
Follansbee (23), F4 .....6.60
Yorkville, O. W10 .....7.375

SHEETS, Long Terne Steel
(Commercial Quality)

Beech Bottom, W.Va. W10 5.85
Gary, Ind. U5 .....5.85
Mansfield, O. E6 .....5.85
Middletown, O. A10 ....5.85
Niles, O. N12 .....5.85
Weirton, W.Va. W6 ....5.85

SHEETS, Long Terne, Ingot Iron

Middletown, O., A10 ....6.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div. Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C31 Chester Blast Furnace Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Josiyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman & Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng. HighCarb. Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S. & W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P23 Pacific Steel Rolling

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W.Va. Steel & Mfg. Co.
W8 West. Auto. Mach. Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.05
Allenport,Pa. P7	4.05
Alton,Ill. L1	4.225
Ashland,Ky.(8) A10	4.05
Atlanta A11	4.25
Bessemer,Ala. T2	4.05
Birmingham C15	4.05
Bridgeport,Conn.(10)S15	4.05
Buffalo(27) R2	4.05
Conshohocken,Pa. A3	4.10
Detroit M1	4.20
Ecorse,Mich. G5	4.15
Fairfield,Ala. T2	4.05
Fontana,Calif. K1	4.825
Gary,Ind. U5	4.05
Houston,Tex.(9) S5	*4.30*
Ind.Harbor,Ind. I-2, Y1	4.05
Johnstown,Pa.(35) B2	4.05
KansasCity,Mo.(9) S5	*4.30*
Lackawanna,N.Y.(25) B2	4.05
LosAngeles(25) B3	4.80
Milton,Pa. M18	4.05
Minnequa,Colo. C10	5.15
NewBritain(10) S15	4.05
N.Tonawanda,N.Y. B11	4.05
Pittsburg,Calif. C11	4.80
Portsmouth,O. P12	4.05
Riverdale,Ill. A1	4.05
SanFrancisco S7	5.00
Seattle(25) B3, P23	5.05
Seattle N14	5.05
Sharon,Pa. S3	4.05
So.Chicago,Ill. W14	4.05
So.SanFrancisco(25) B3	4.80
SparrowsPoint,Md. B2	4.05
Sterling(1) N15	4.05
Sterling,Ill. N15	4.15
Torrance,Calif. C11	4.80
Warren,O. R2	4.05
Weirton,W.Va. W6	4.05
Youngstown U5	4.05

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10)S15	6.45
Carnegie,Pa. S18	6.70
Fontana,Calif. K1	8.10
Gary,Ind. U5	6.70
Houston,Tex. S5	*6.95*
Ind.Harbor,Ind. Y1	6.70
KansasCity,Mo. S5	*6.95*
LosAngeles B3	7.90
NewBritn.,Conn.(10)S15	6.45
Newport,Ky. N9	6.70
Seattle P23	7.80
Sharon,Pa. S3	6.70
So.Chicago W14	6.70
Youngstown U5, Y1	6.70

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	6.15
Conshohocken,Pa. A3	6.15
Ecorse,Mich. G5	6.25
Fairfield,Ala. T2	6.15
Fontana,Calif. K1	7.25
Gary,Ind. U5	6.15
Houston S5	6.55
Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.75
Lackawanna,N.Y. B2	6.15
LosAngeles(25) B3	6.90
Seattle(25) B3, P23	7.15
Sharon,Pa. S3	6.15
So.SanFrancisco(25) B3	6.90
SparrowsPoint,Md. B2	6.15
Warren,O. R2	6.15
Weirton,W.Va. W6	6.15
Youngstown U5, Y1	6.15

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.30
Warren,O. R2	4.65

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	5.75
Baltimore T6	5.75
Bridgeport,Conn.(10)S15	5.75
Cleveland A7, J5	5.75
Conshohocken,Pa. A3	5.80
Dearborn,Mich. D3	5.85
Detroit M1, P20	5.90
Detroit D2	5.85
Dover,O. G6	5.75
Ecorse,Mich. G5	5.85
Follansbee,W.Va. F4	5.75
Fontana,Calif. K1	7.65
FranklinPark,Ill. T6	5.85
Ind.Harbor,Ind. I-2	5.85
Ind.Harbor,Ind. Y1	5.75
Indianapolis C8	5.90
Lackawanna,N.Y. B2	5.75
LosAngeles C1	7.80
Mattapan,Mass. T6	6.30
Middletown,O. A10	5.75
NewBedford,Mass. R10	6.20
NewBritain(10) S15	5.75
NewCastle,Pa. B4, E5	5.75
NewHaven,Conn. A7	6.50
NewHaven,Conn. D2	6.20
Pawtucket,R.I. R3	6.40
Pawtucket,R.I. N8	6.30
Pittsburgh J5	5.75
Portsmouth,O. P12	5.75
Riverdale,Ill. A1	5.85
Rome,N.Y.(32) R6	5.75
Sharon,Pa. S3	5.75
SparrowsPt.,Md. B2	5.75
Trenton,N.J.(31) R5	7.30
Wallingford,Conn. W2	6.20
Warren,O. B9, R2, T5	5.75
Weirton,W.Va. W6	5.75
Worcester,Mass. A7	6.60
Youngstown C8, Y1	5.75

STRIP, Cold-Rolled Alloy

Carnegie,Pa. S18	12.45
Cleveland A7	12.45
Dover,O. G6	12.45
Fontana,Calif. K1	14.55
FranklinPark,Ill. T6	12.45
Harrison,N.J. C18	12.45
Mattapan,Mass. T6	12.80
Pawtucket,R.I. N8	12.80
Sharon,Pa. S3	12.45
Worcester,Mass. A7	12.75
Youngstown C8	12.90

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7, J5	8.60
Dearborn,Mich. D3	8.70
Dover,O. G6	8.60
Ecorse,Mich. G5	8.70
Ind.Harbor,Ind. Y1	8.60

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	5.75	8.35	9.30	11.45	14.15
Bridgeport,Conn.(10) S15	5.75	8.05	9.00	11.15	13.85
Bristol,Conn. W1	...	...	9.30	11.45	...
Carnegie,Pa. S18	...	8.05	9.00	11.15	13.85
Cleveland A7	5.75	8.05	9.00	11.15	13.85
Cleveland C7	...	8.05	9.00	11.15	13.85
Dearborn,Mich. D3	5.85	8.25	9.20	....	....
Detroit D2	5.85	8.25	9.20	10.95	....
Dover,O. G6	5.85	8.05	9.00	11.15	13.85
FranklinPark,Ill. T6	5.85	8.05	9.00	11.15	13.85
Harrison,N.J. C18	...	...	9.30	11.45	14.15
Indianapolis C8	6.00	8.20	9.00	11.15	13.85
Mattapan, Mass. T6	6.30	8.35	9.30	11.45	14.15
NewBritn.,Conn.(10) S15.	5.75	8.05	9.00	11.15	13.85
NewCastle,Pa. B4	5.75	8.05	9.00	11.15	....
NewCastle,Pa. E5	5.75	8.05	9.00	11.15	13.85
NewHaven,Conn. D2	6.20	8.35	9.30	11.25	....
New York W3	...	8.35	9.30	11.45	14.15
Pawtucket,R.I. N8	6.30	8.35	9.30	11.45	14.15
Riverdale,Ill. A1	5.85	8.05	9.00	11.15	13.85
Rome,N.Y.(32) R6	5.75	8.05	9.00	10.95	13.25
Sharon,Pa. S3	5.75	8.05	9.00	11.15	13.85
Trenton,N.J. R5	...	8.35	9.30	11.45	14.15
Wallingford,Conn. W2	6.20	8.35	9.30	11.45	14.15
Warren,O. T5	5.75	8.05	9.00	11.15	13.85
Weirton,W.Va. W6	5.75	8.05	9.00	11.15	13.85
Worcester,Mass. A7, T6..	6.60	8.35	9.30	11.45	14.15
Youngstown C8	5.85	8.05	9.00	11.15	13.85

Spring Steel (Tempered)

Bristol,Conn. W1	...	...	12.90	15.60	....
Buffalo W12	...	...	12.90	....	....
FranklinPark,Ill. T6	...	...	13.40	16.10	19.50
Harrison,N.J. C18	...	...	12.90	15.60	19.00
NewYork W3	...	...	12.90	15.60	19.00
Trenton,N.J. R5	...	...	12.90	15.60	19.00
Worcester,Mass. A7, T6..	...	...	12.90	15.60	19.00
Worcester,Mass. W12	...	...	12.90	....	....
Youngstown C8	...	...	13.25	15.95	19.35

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	....	9.10	10.10	11.00
Brackenridge,Pa. A4	....	....	9.10	10.10	11.00
Mansfield,O. E6	8.025	8.50	9.10	10.10	11.00
Newport,Ky. N9	8.025	8.50	9.10	10.10	11.00
Niles,O. N12	8.025	8.50	9.10	10.10	....
Vandergrift,Pa. U5	....	8.50	9.10	10.10	11.00
Warren,O. R2	8.025	8.50	9.10	10.10	11.00
Zanesville,O. A10	....	8.50	9.10	10.10	11.00

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	....	....	9.35	10.55	11.75
GraniteCity,Ill. G4	8.425*	8.95*	9.35*	10.55*	....
IndianaHarbor,Ind. I-2	8.225	8.75*	9.35*	....	....
Vandergrift,Pa. U5	....	9.25†	9.85†	10.55†	11.75†
Vandergrift,Pa. U5	8.225*	8.75*	9.35*	10.35*	11.25*
Warren,O. R2	8.225†	9.25	9.85	10.55	11.75
Zanesville,O. A10	....	9.25	9.85	10.55	11.75

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.95	12.50	13.00	14.00
Brackenridge,Pa. A4	11.95	....	....	....
Newport,Ky. N9	11.95	....	....	....
Vandergrift,Pa. U5	11.95	12.50	13.00	14.00
Zanesville,O. A10	11.95‡	12.50‡	13.00‡	14.00‡

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-72
Brackenridge,Pa. A4	....	15.00	16.60	17.10	....
Butler,Pa. A10	....	....	16.60	17.10	....
Vandergrift,Pa. U5	14.00	15.00	16.60	17.10	12.70‡
Warren,O. R2	....	....	....	....	12.70‡

* Semiprocessed. † Fully processed only. ‡ Coils annealed; semiprocessed ½c lower. ‖ Coils, ¾-cent higher.

Lackawanna,N.Y. B2	8.425
Pittsburgh J5	8.60
Sharon,Pa. S3	8.60
SparrowsPoint,Md. B2	8.425
Warren,O. R2	8.60
Weirton,W.Va. W6	8.60
Youngstown Y1	8.60

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	6.35

STRIP, Electrogalvanized

Cleveland A7	5.75*
Dover,O. G6	5.75*
Riverdale,Ill. A1	5.85*
Youngstown C8	5.75*
Warren,O. B9, T5	5.75*
Weirton,W.Va. W6	5.75*
Worcester,Mass. A7	6.60*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	6.15
Warren,O. B9	6.15

TIGHT COOPERAGE HOOP

Atlanta A11	4.775
Riverdale,Ill. A1	4.625
Sharon,Pa. S3	4.475
Youngstown U5	4.475

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.60
Fairfield,Ala. T2	6.70
Fairless,Pa. U5	6.70
Gary,Ind. U5	6.60
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.60
Irvin,Pa. U5	6.60
Niles,O. R2	6.60
Pittsburg,Calif. C11	7.35
SparrowsPoint,Md. B2	6.70

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.50	$7.75	$8.15
Fairfield,Ala. T2	7.60	7.85	8.25
Fairless,Pa. U5	7.60	7.85	8.25
Gary,Ind. U5	7.50	7.75	8.15
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.50	7.75	8.15
Irvin,Pa. U5	7.50	7.75	8.15
Niles,O. R2	7.50	7.75	8.15
Pittsburg,Calif. C11	8.25	8.50	8.90
SparrowsPoint,Md. B2	7.60	7.85	8.25
Weirton,W.Va. W6	7.50	7.75	8.15
Yorkville,O. W10	7.50	7.75	8.15

ELECTROTIN (22-27 Gage; Dollars per 100 lb)

Aliquippa,Pa. J5	6.175	....	....
Niles,O. R2	6.175	6.375	6.575

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.80	$9.05
Fairfield,Ala. T2	8.90	9.15
Fairless,Pa. U5	8.90	9.15
Gary,Ind. U5	8.80	9.05
Ind.Har. I-2, Y1	8.80	9.05
Irvin,Pa. U5	8.80	9.05
Pitts.,Cal. C11	9.55	9.80
Sp.Pt.,Md. B2	8.90	9.15
Warren,O. R2	8.80	9.05
Weirton,W.Va. W6	8.80	9.05
Yorkville,O. W10	8.80	9.05

Warren,O. R2	6.60
Weirton,W.Va. W6	6.60
Yorkville,O. W10	6.60

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	6.20
Gary,Ind. U5	6.20
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.20
Irvin,Pa. U5	6.20
Yorkville,O. W10	6.20

MANUFACTURING TERNES (Special Coated; Base Box)

Gary,Ind. U5	$7.55
Irvin,Pa. U5	7.55
Yorkville,O. W10	7.55

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10	$6.75

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.85

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.75
Aliquippa,Pa. J5	5.75
Alton,Ill. L1	5.925
Atlanta A11	5.95
Bartonville,Ill. K4	5.85
Buffalo W12	5.75
Chicago W13	5.75
Cleveland A7, C20	5.75
Crawfordsville,Ind. M8	5.85
Donora,Pa. A7	5.75
Duluth,Minn. A7	5.75
Fairfield,Ala. T2	5.75
Fostoria,O.(24) S1	5.95
Houston S5	*6.00*
Jacksonville,Fla. M8	6.27
Johnstown,Pa. B2	5.75
Joliet,Ill. A7	5.75
KansasCity,Mo. S5	*6.00*
Kokomo,Ind. C16	5.85
LosAngeles B3	6.70
Minnequa,Colo. C10	6.00
Monessen,Pa. P7	5.75
Newark 6-8 ga. I-1	6.40
No.Tonawanda B11	5.75
Palmer,Mass. W12	6.05
Pittsburg,Calif. C11	6.70
Portsmouth,O. P12	5.75
Rankin,Pa. A7	5.75
So.Chicago,Ill. R2	5.75
So.SanFrancisco C10	6.70
SparrowsPoint,Md. B2	5.85
Sterling,Ill.(1) N15	5.75
Sterling,Ill. N15	5.85
Struthers,O. Y1	5.75
Waukegan,Ill. A7	5.75
Worcester,Mass. A7	6.00

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	7.20
Alton,Ill. L1	7.375
Bartonville,Ill. K4	7.30
Buffalo W12	7.20
Cleveland A7	7.20
Donora,Pa. A7	7.20
Duluth,Minn. A7	7.20
Fostoria,O. S1	7.20
Johnstown,Pa. B2	7.20
LosAngeles B3	8.15
Milbury,Mass.(12) N6	7.50
Minnequa,Colo. C10	7.45
Monessen,Pa. P7, P16	7.20
Muncie,Ind. I-7	7.40
Palmer,Mass. W12	7.50
Pittsburg,Calif. C11	8.15
Portsmouth,O. P12	7.20
Roebling,N.J. R5	7.50
So.Chicago,Ill. R2	7.20
So.SanFrancisco C10	8.15
SparrowsPt.,Md. B2	7.30
Struthers,O. Y1	7.20
Trenton,N.J. A7	7.50
Waukegan,Ill. A7	7.20
Worcester A7,J4,T6,W12	7.50

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.90
Alton,Ill. L1	7.075
Buffalo W12	6.90
Cleveland A7	6.90
Donora,Pa. A7	6.90
Duluth,Minn. A7	6.90
Johnstown,Pa. B2	6.90
KansasCity,Mo. S5	7.50
LosAngeles B3	7.85
Minnequa,Colo. C10	7.075
Monessen,Pa. P7, P16	6.90
NewHaven,Conn. A7	7.20
Palmer,Mass. W12	7.20
Pittsburg,Calif. C11	7.85
Portsmouth,O. P12	6.90
Roebling,N.J. R5	7.20
So.Chicago,Ill. R2	6.90
So.SanFrancisco C10	7.85
SparrowsPoint,Md. B2	7.00
Struthers,O. Y1	6.90
Trenton,N.J. A7	7.20
Waukegan,Ill. A7	6.90
Worcester,Mass. A7	7.20

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	11.375
Bartonville,Ill. K4	11.30
Buffalo W12	11.20
Chicago W13	11.30
Cleveland A7	11.20
Crawfordsville,Ind. M8	11.30
Fostoria,O. S1	11.20
Jacksonville,Fla. M8	11.73
Johnstown,Pa. B2	11.20
Kokomo,Ind. C16	11.20
Minnequa,Colo. C10	10.95
Monessen,Pa. P16	11.20
Muncie,Ind. I-7	11.40
Palmer,Mass. W12	11.50
Roebling,N.J. R5	11.50
So.SanFrancisco C10	11.55
Waukegan,Ill. A7	11.20
Worcester,Mass. A7,T6	11.50

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	9.90
Buffalo W12	9.90
Johnstown,Pa. B2	9.90
Minnequa,Colo. C10	10.025
Monessen,Pa. P16	9.90
Muncie,Ind. I-7	10.10
Portsmouth,O. P12	9.90
Roebling,N.J. R5	10.20
SparrowsPt.,Md. B2	10.00

ROPE WIRE (A)

Alton,Ill. L1	9.75
Bartonville,Ill. K4	9.75
Buffalo W12	9.75
Fostoria,O. S1	9.75
Johnstown,Pa. B2	9.75
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
SparrowsPt. B2	9.85
Struthers,O. Y1	9.75
Worcester J4, T6	9.85

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE

(Continued)

WIRE, Tire Bead

Alton,Ill. L1	13.25
Bartonville,Ill. K4	13.25
Monessen, Pa. P16	13.15
Portsmouth,O. P12	13.15
Roebling,N.J. R5	13.45

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	7.95
Baltimore T6	8.25
Buffalo W12	7.95
Cleveland A7	7.95
Crawfordsville,Ind. M8	8.05
Dover,O. G6	7.95
Fostoria,O. S1	7.95
FranklinPark,Ill. T6	8.05
Kokomo,Ind. C16	8.65
Massillon,O. R5	7.95
Milwaukee C23	8.15
Monessen,Pa. P7, P16	7.95
Pawtucket,R.I. N8	8.25
Rome,N.Y.(32) R6	7.95
Trenton,N.J. R5	8.25
Worcester A7, T6, W12	8.25

WIRE, Merchant Quality

	(6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	6.90	7.30**
Aliquippa J5	6.90	7.425‡
Atlanta A11	7.00	7.55
Bartonville(48) K4	7.90	7.55
Buffalo W12	6.90	7.30†
Cleveland A7	6.90	
Crawfordsville M8	7.00	7.55
Donora,Pa. A7	6.90	7.30†
Duluth,Minn. A7	6.90	7.30†
Fairfield T2	6.90	7.30†
Houston,Tex. S5	*7.15*	*7.55†*
Jacks'ville,Fla. M8	7.425	7.95
JohnstownB2(48)	6.90	7.45*
Joliet,Ill. A7	6.90	7.30†
KansasCity,Mo. S5	*7.15*	*7.55†*
Kokomo C16	7.00	7.40†
LosAngeles B3	7.85	
Minnequa C10	7.15	7.55**
Monessen P7 (48)	6.90	7.45
Palmer W12	7.20	7.60†
Pitts.,Calif. C11	7.85	8.25†
Portsmouth,O. P12	6.90	
Rankin A7	6.90	7.30†
So.Chicago R2	6.90	7.30**
S.S.Fran. C10	7.85	8.25**
SparwsPt.B2(48)	7.00	7.55*
Sterling(1)(48)N15	6.90	7.45
Struthers,O.(48)Y1	6.90	7.40‡
Worcester A7	7.20	

*Based on 11c zinc; †5c zinc; ‡ Less than 10c zinc; **Subject to zinc equalization extras.

WOVEN FENCE, 9-15½Ga.

	Col.
Ala.City,Ala. R2	146**
Ala.City, 17 ga. R2	241**
Ala.City, 18 ga. R2	251**
Alig'ppa,Pa.9-14½ga.J5	149‡
Atlanta A11	151
Bartonville,Ill. K4	151
Crawfordsville,Ind. M8	151
Donora,Pa. A7	146†
Duluth,Minn. A7	146†
Fairfield,Ala. T2	146†
Houston,Tex. S5	*151†*
Johnstown,Pa.(43) B2	149
Joliet,Ill. A7	146†
KansasCity,Mo. S5	*151†*
Kokomo,Ind. C16	148†
Minnequa,Colo. C10	154**
Monessen,Pa. 9 ga. P17	149
Pittsburg,Calif. C11	169†
Rankin,Pa. A7	146†
So.Chicago,Ill. R2	146**
Sterling,Ill.(1) N15	149

†Based on 5c zinc; *11c zinc; ‡ 10c zinc; **Subject to zinc equalization extras.

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	155
Atlanta A11	157
Bartonville,Ill. K4	157
Crawfordsville,Ind. M8	157
Donora,Pa. A7	155
Duluth,Minn.A7	155
Fairfield,Ala. T2	155
Joliet,Ill. A7	155
Houston S5	*160*
KansasCity,Mo. S5	*160*
Kokomo,Ind C16	157
Minnequa,Colo. C10	160
Pittsburg,Calif. C11	179
So.Chicago,Ill. R2	155
So.SanFran.,Calif. C10	179
SparrowsPoint,Md. B2	157
Sterling,Ill.(1) N15	155

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	159**
Aliquippa J5	156‡
Atlanta A11	164
Bartonville,Ill. K4	164
Crawfordsville,Ind. M8	164
Donora,Pa. A7	159†
Duluth,Minn. A7	159†
Fairfield,Ala. T2	159†
Houston,Tex. S5	*164†*
Johnstown,Pa. B2	162*
Joliet,Ill. A7	159†
KansasCity,Mo. S5	*164†*
Kokomo,Ind. C16	161†
Minnequa,Colo. C10	165**
Monessen,Pa. P7	162
Pittsburg,Calif. C11	179†
Rankin,Pa. A7	159†
So.Chicago,Ill. R2	159**
S.SanFrancisco C10	179**
SparrowsPoint,Md. B2	164*
Sterling,Ill. (1) N15	162

† Based on 8c zinc; *11c zinc; ‡10c zinc; **Subject to zinc equalization extras.

WIRE (16 gage)

	An'ld Galv.	Stone Stone
Ala.City R2	13.15	14.70**
Bartonville K4	13.25	15.10
Buffalo W12	13.15	
Cleveland A7	13.15	
Crawfrdsville M8	13.25	15.10
Fostoria,O. S1	13.25	14.80†
Johnstown B2	13.15	15.00*
Kokomo C16	13.25	14.80†
Minnequa C10	13.40	15.10**
Palmer,Mas.W12	13.15	14.70†
Pitts.,Calif. C11	13.80	15.05†
So.Chicago R2	13.15	14.70
SparrowsPt. B2	13.25	15.10*
Sterling(1) N15	13.15	15.00
Waukegan A7	13.15	14.70†
Worcester A7	13.45	

* Based on 11c zinc; † 5c zinc; ‡ 10c zinc; **Subject to zinc equalization extras.

NAILS, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	137
Aliquippa,Pa. J5	137
Atlanta A11	139
Bartonville,Ill. K4	139
Chicago,Ill. W13	137
Cleveland A9	142
Crawfordsville,Ind. M8	139
Donora,Pa. A7	137
Duluth,Minn. A7	137
Fairfield,Ala. T2	137
Galveston,Tex. D7	139
Houston,Tex. S5	*142*
Johnstown,Pa. B2	137
Joliet,Ill. A7	137
KansasCity,Mo. S5	*142*
Kokomo,Ind. C16	139
Minnequa,Colo. C10	142
Monessen,Pa. P7	137
Pittsburg,Calif. C11	156
Rankin,Pa. A7	137
So.Chicago,Ill. R2	137
SparrowsPt.,Md. B2	139
Sterling,Ill.(1) N15	137
Worcester,Mass. A7	143

NAILS, CUT (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$8.30
Wheeling,W.Va. W10	8.30

STAPLES, Polished Stock

To dealers & mfrs. (7)	Col.
Aliquippa,Pa. J5	138
Atlanta A11	140
Bartonville,Ill. K4	139
Crawfordsville,Ind. M8	139
Donora,Pa. A7	138
Duluth,Minn. A7	138
Fairfield,Ala. T2	138
Johnstown,Pa. B2	138
Joliet,Ill. A7	138
Kokomo,Ind. C16	139
Minnequa,Colo. C10	142
Monessen,Pa. P7	137
Pittsburg,Calif. C11	157
Rankin,Pa. A7	138
SparrowsPt.,Md. B2	140
Sterling,Ill. (1) N15	137
Worcester,Mass. A7	144

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2, I-2	150
Duluth,Minn. A7	150
Franklin,Pa. F6	150
Johnstown,Pa. B2	150
Marion,O. P11	150
Minnequa,Colo. C10	155
Moline,Ill. R3	155
So.Chicago,Ill. R2	150
Tonawanda,N.Y. B12	150
Williamsport,Pa. S19	150

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(Base discounts, per cent off list, f.o.b. midwestern plants)

6 in. and shorter:	
½-in. & smaller diam	2
Over 4 in. through 6 in.:	
½ in. & smaller diam	+3
6 in. and shorter:	
⅝-in. and ⅞-in.	+4
1 in. and larger	+6
Longer than 6 in.:	
All diameters	+15
Lag bolts, all diams.:	
6 in. and shorter	6
Over 6 in. long	+2
Ribbed Necked Carriage	+4
Blank	10
Plow	23
Step, Elevator, Tap and Sleigh Shoes	10
Tire Bolts	+3
Boiler & Fitting-Up Bolts	21

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	55
H.P., Hex. regular & heavy:	
⅝" and smaller	55
¾" to 1⅛", inclusive	50
1¼" to 1½", inclusive	60
1⅝" and larger	55
C.P. Hex regular & heavy:	
All sizes	55
Hot Galv. Nuts (all types):	
⅝" or smaller	38
¾" to 1½", inclusive	41
Finished Hex Nuts:	
New standard, all sizes	55
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	55

SQUARE HEAD SET SCREWS

(1035 steel; packaged; per cent off list)

1 in. diam. x 6 in. and shorter	34
1 in. and smaller diam. x over 6 in.	30

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼ in. diam. & larger	14
N.F. thread, all diams.	6

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	43
Plated finishes	23

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
¼ in. through ⅝-in.	38
⅝-in. through 1 in.	18
Longer than 6 in.:	
¼-in. through ⅝-in.	20
⅝-in. through 1 in.	7

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 9.25
⅞-in. under..List less 37%

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. in.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.50	19.00
1¼	13	....	23.21	18.77
1½	13	21.40	26.65	20.75
1⅝	13	25.28	30.31	24.52
2	13	28.53	33.97	27.46
2¼	13	31.91	38.36	30.95
2½	12	34.63	41.83	33.59
2¾	12	38.15	45.74	37.00
2⅞	12	41.31	49.53	40.07
3	12	44.05	52.82	42.72

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 3	Std. Toe Rails All No. 2	Std. Toe Rails 60 lb Under
Bessemer,Pa. U5	4.45	4.35	4.40	8.35
Ensley,Ala. T2	4.45	4.35	...	8.35
Fairfield,Ala. T2	...	...	...	8.35
Gary,Ind. U5	4.45	4.35	4.40	...
IndianaHarbor,Ind. I-2	4.45	4.35	4.40	...
Johnstown,Pa. B2	...	...	...	(16)8.35
Lackawanna,N.Y. B2	4.45	4.35	...	8.35
Minnequa,Colo. C10	4.45	4.35	...	8.55
Steelton,Pa. B2	4.45	4.35	...	8.35
Williamsport,Pa. S19	...	...	...	8.35

TIE PLATES

Fairfield,Ala. T2	5.275
Gary,Ind. U5	5.275
Ind.Harbor,Ind. I-2	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Seattle B3	5.425
Steelton,Pa. B2	5.275
Torrance,Calif. C11	5.425

TRACK BOLTS (30) Treated

Cleveland R2	11.50
KansasCity,Mo. S5	11.50
Lebanon,Pa. B2	11.50
Minnequa,Colo. C10	11.50
Pittsburgh G3, P14	11.50
Seattle B3	12.00

AXLES

Ind.Harbor,Ind. S13	6.75
Johnstown,Pa. B2	6.75

JOINT BARS

Bessemer,Pa. U5	5.425
Fairfield,Ala. T2	5.425
Ind.Harbor,Ind. I-2	5.425
Joliet,Ill. U5	5.425
Lackawanna,N.Y. B2	5.425
Minnequa,Colo. C10	5.425
Steelton,Pa. B2	5.425

SCREW SPIKES

Cleveland R2	11.00

STANDARD TRACK SPIKES

Fairfield,Ala. T2	7.30
Ind.Harbor,Ind. I-2, Y1	7.30
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.30
Minnequa,Colo. C10	7.30
Pittsburgh J5	7.30
Seattle B3	7.80
So.Chicago,Ill. R2	7.30
Struthers,O. Y1	7.30
Youngstown R2	7.30

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron: 98+% Fe, annealed	15.25
Unannealed:	
Minus 100 mesh	11.75
Minus 35 mesh	9.25
Minus 20 mesh	9.00
Swedish, c.i.f. N.Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N. J., in bags	9.50
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in.	22.00
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	32.50
Unannealed (99+% Fe) (minus 325 mesh)	52.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns—62.00-148.00	
Aluminum:	
Atomized, 500 lb drums, frgt. allowed:	
Carlots	30.00
Ton lots	32.00
Antimony, 500 lb lots	22.00*
Brass, 5000-lb lots	29.75-37.25†
Bronze, 5000-lb lots	48.75-52.00†
Copper:	
Electrolytic	13.75*
Reduced	13.75*
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	94.00
Nickel-Silver, 5000-lb lots	45.50‡
Nickel-Silver, 5000-lb lots	49.00**
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	7.00*
Stainless Steel, 302	91.00
Tin	14.50*
Zinc, 5000-lb lots	17.25-31.00‡
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	4.95
Less than 1000 lb	5.10
Chromium, electrolytic 99.2% Cr min.	3.80

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 30% Zn, 10% Ni; **64% Cu 18% Zn, 18% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼" to 1 7/16"; 1 7/16" to 1 15/16" 4.75c; 1 15/16" to 7 5/16" 5.15c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cents lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.142 to 0.249 in.; for gage 0.142 and lighter, 5.60c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 26" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 4.95c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon, add 0.40c for alloy and 0.35c H.S.L.A.
(31) Widths over ⅝-in.; 6.40c for widths ⅝-in. and under by 0.135 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9 0c for cut lengths.
(35) 72" and narrower.
(36) 55" and narrower.
(37) 13 gage & heavier; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.055" and heavier, 0.25c higher.
(41) 9 10c for cut lengths.
(42) Mill lengths, f.o.b. mill; delivered to mill zone or within switching limits, 5.10c.
(43) 9-14½ gage.
(48) 6-7 gage.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		56.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Ambridge, Pa. N2	13.5	...	17.5	...	20	...	21.5	...	21.5	...	20.75	...	23.25	...
Lorain, O. N3	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Youngstown Y1	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Alton, Ill. L1	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Benwood, W. Va. W10	24	+4.5	15.25	+10.25	7.25	+17.25	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Butler, Pa. F6	25	+3.5	17	+8.5	9.5	+15	....	..	....	...	....	..	....	....
Etna, Pa. N2	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Fairless, Pa. N3	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Fontana, Calif. K1	...	...	....	....	....	....	10.75	+6.5	13.75	+2.5	16.25	1	18.75	2.25
Ind. Harbor, Ind. Y1	...	...	....	....	....	....	22.75	5.5	25.75	9.5	28.25	13	30.75	14.25
Lorain, O. N3	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sharon, Pa. S4	25	+3.5	17	+8.5	9.5	+15	....	..	....	...	....	..	....	....
Sharon, Pa. M6	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sparrows Pt., Md. B2	23	+5.5	15	+10.5	7.5	+17	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Youngstown R2, Y1	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Wheatland, Pa. W9	23	+5.5	15	+10.5	7.5	+17	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25

Size—Inches	1¼		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	....	....	....
Alton, Ill. L1	30.25	14.25	30.75	14.75	32.25	15	32.25	15	....	....	....	....
Benwood, W. Va. W10	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Etna, Pa. N2	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Fairless, Pa. N3	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Fontana, Calif. K1	19.25	3.25	19.75	3.75	21.25	4	21.25	4	12.5	+5.25	12.5	+5.25
Ind. Harbor, Ind. Y1	31.25	15.25	31.75	15.75	33.25	16	33.25	16	24.5	6.75	25.5	6.75
Lorain, O. N3	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	....	....	....
Sharon, Pa. M6	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	....	....	....
Sparrows Pt., Md. B2	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Youngstown R2, Y1	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Wheatland, Pa. W9	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75

*Galvanized pipe discounts based on current price of zinc (11.50c, East St. Louis).

Stainless Steel

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. Bars; H.R. Strip	Wire	Plates	Sheets	C.R. Strip; Flat Wire
201	16.75	21.00	30.00	34.75	30.25	35.75	37.75	41.75	38.75
302	17.75	23.25	30.25	35.00	32.50	36.00	38.00	42.00	42.00
302B	19.00	25.00	31.00	35.00	35.50	36.00	38.00	45.25	45.25
303	....	25.25	32.75	37.75	....	38.75	40.25	46.00	46.00
304	19.00	24.50	31.75	36.75	35.00	38.00	40.50	44.50	44.50
304L	....	....	36.75	41.75	40.00	43.00	45.50	49.50	49.50
305	20.50	26.50	33.50	37.25	38.00	38.00	41.00	47.50	47.50
308	20.75	27.25	36.25	41.75	39.00	43.00	47.00	49.00	49.00
309	27.75	36.00	44.00	50.50	50.50	51.75	55.00	63.25	63.25
309S	29.75	38.75	48.00	55.75	55.25	56.75	60.25	69.75	69.75
310	35.00	45.25	58.75	68.25	64.75	69.50	71.00	74.25	74.25
314	....	....	....	....	....	....	71.00	....	....
316	29.75	38.00	48.25	56.25	55.00	57.25	60.50	64.50	64.50
316L	....	....	53.25	61.25	60.00	62.25	65.50	69.50	69.50
317	35.00	45.50	59.25	68.75	69.50	70.25	72.75	79.00	79.00
321	23.50	30.25	36.00	41.50	41.75	42.75	46.50	51.25	51.25
330	....	....	61.50	....	....	72.00	73.25	81.25	81.25
18-8CbTa	29.25	38.25	46.00	52.25	53.00	53.75	58.50	66.50	66.50
403	....	....	27.00	30.75	....	32.00	34.25	....	....
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	29.75	39.75
410	14.00	18.25	24.00	27.25	26.25	28.75	30.00	34.25	34.25
414	....	....	24.50	....	....	29.25	30.50	35.25	35.25
416	....	....	24.50	28.25	....	29.25	....	....	....
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	52.75	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	34.75	34.75
430F	....	....	25.00	28.75	....	29.75	....	....	....
431	15.00	19.25	25.00	28.75	28.00	29.75	31.00	35.75	35.75
446	....	....	32.50	38.25	50.25	39.50	40.75	59.75	59.75

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets, Carbon Base 30%
Stainless:			
302	....	31.00	31.00
304	27.60–28.30	32.50–33.60	32.50
304-L	30.30	35.50	....
316	32.60–33.40	37.70–42.75	42.75
316-L	37.80	43.30	....
316-CB	38.90	45.50	....
321	29.30–30.00	34.40–37.00	37.00
347	30.40–32.20	35.50–40.50	40.50
405	23.40–23.90	30.60–31.10	....
410	22.90–23.40	30.10–30.60	....
430	23.40	30.60	....
Inconel	47.90	63.90	....
Nickel	39.50	54.10	....
Monel	40.80	54.80	....
L-Nickel	41.70	58.50	....
Copper*	....	....	46.90

	Strip, Carbon Base: Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Copper*	28.85	35.85	25.00	32.25

* Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.26	5% Cr Hot Work	0.405
Extra Carbon	0.31-.315	W-Cr Hot Work	0.425
Special Carbon	0.37	V-Cr Hot Work	0.445
Oil Hardening	0.405	Hi-Carbon-Cr	0.73

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.030
18.25	4.25	1	4.75	...	2.245-2.415
18	4	2	9	...	2.615
18	4	2	....	...	1.705
18	4	1	....	...	1.540
14	4	2	5	...	2.185
13.75	3.75	2	5	...	2.185
13.5	4	3	....	...	1.805
9	3.5	..	....	...	1.115
6	4	2	....	5	1.045
6	4	3	....	6	1.290
1.5	4	1	....	8.5	0.900

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L2, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

Birmingham District	Basic	No. 2 Foundry	Malle-able	Besse-mer
AlabamaCity,Ala. R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	56.50†	....
Gadsden,Ala. R2	52.38	52.88	....	....
Cincinnati, deld.	....	60.58	....	....
Buffalo District				
Buffalo H1, R2	56.00	56.50	57.00	57.50
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No.Tonawanda,N.Y. T9	....	56.50	57.00	57.50
Boston, deld.	66.65	67.15	67.65	....
Rochester, N.Y., deld.	59.02	59.52	60.02	....
Syracuse,N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Chicago R2	56.00	....	56.50	....
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	58.17	58.67	58.67	59.17
MuskegonMich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7, R2	56.00	56.50	56.50	57.00
Akron,O., deld.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	58.00	58.50	59.00	59.50
New York, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Birdsboro,Pa. B10	58.00	58.50	....	....
Chester,Pa. C31	....	48.50	49.00	....
Philadelphia, deld.	....	50.16	50.66	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, deld.	59.66	60.16	60.66	61.16
Troy,N.Y. R3	58.00	58.50	59.00	59.50
Pittsburgh District				
Neville Island,Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	57.87	57.87	58.37
McKeesRocks, deld.	....	57.54	57.54	58.04
Lawrenceville,Homestead, Wilmerding,Monaca, deld.	....	58.16	58.16	58.66
Verona,Trafford, deld.	58.19	58.69	58.69	59.19
Brackenridge, deld.	58.45	58.95	58.95	59.45
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....

Youngstown District	Basic	No. 2 Foundry	Malle-able	Besse-mer
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U3	56.00	....	....	57.00
Mansfield,O. deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	60.50	61.00	61.50	....
Fontana,Calif. K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar, Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T2	....	52.50*	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos, southern grade. †Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.00 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson,O. G2, J1	$65.00
Buffalo H1	66.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$80.50
Keokuk,Iowa, Openhearth & Fdry, freight allowed K2	85.00
Keokuk, OH & Fdry, 12½ lb pigiets, 16% Si, frgt allowed K2	88.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate A7	$61.00
Lyle,Tenn. T3	70.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, deld.	67.55
Troy,N.Y. R2	64.00

Warehouse Steel Products

Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Birmingham and St. Paul, 15 cents; Philadelphia, New York, Boston and Los Angeles, 10 cents; Buffalo, 25 cents on C.R. and galvanized sheets, C.F. and alloy bars and 20 cents on other commodities; Houston, Seattle, Spokane, Wash., no charge.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	Stainless Type 302‡§	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.§	H.R. Alloy 4140††‡		Carbon	Floor
Baltimore	6.02	7.51	7.79	....	6.69	...	6.68	8.52¢	12.04	6.72	6.37	7.76
Birmingham	6.35	7.35	8.25‡	....	6.60	...	6.50	9.10	....	6.65	6.65	8.45
Boston	7.23	8.23	9.52	45.28¶	7.47	...	7.20	8.60	12.45	7.49	7.37	8.50
Buffalo	6.35	7.40	8.79	....	6.70	...	6.50	7.85	12.15	6.72	6.65	7.90
Charlotte, N. C.	6.95	7.80	8.69	....	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.38	7.38	8.30	46.05	6.62	...	6.51	7.50	11.90	6.69	6.52	7.64
Cincinnati	6.49	7.37	8.30	45.80	6.86	...	6.75	7.80	12.15	6.86	6.81	7.89
Cleveland	6.38	7.38	8.45	45.66	6.72	...	6.57	7.60	11.96	7.02	6.69	7.81
Detroit	6.57	7.57	8.58	43.50	6.90	7.36	6.79	7.79	12.10	7.16	6.80	7.83
Erie, Pa.	6.35	7.38	8.30	....	6.70	...	6.50	7.45¢	....	6.69	6.52	7.64
Houston	7.35	7.80	9.93	....	7.70	9.30	7.70	9.50	....	7.60	7.35	8.75
Los Angeles	7.50	9.35	9.95	50.15	7.85	11.75	7.45	10.15	13.20	7.65	7.45	9.55
Milwaukee	6.47	7.47	8.39	...	6.71	...	6.60	7.69	11.99	6.86	6.61	7.73
Moline, Ill.	6.73	7.73	8.65	....	6.97	...	6.86	7.85	....	7.04	6.87	...
New York	6.97	7.91	8.79	44.95	7.56	...	7.37	8.73¢	12.28	7.38	7.27	8.68
Norfolk, Va.	7.00	...	...	....	7.10	...	7.10	8.60	....	7.10	7.10	7.95
Philadelphia	6.19	7.44	8.26	41.98¶	6.96	8.80	6.74	8.36¢	12.10	6.54	6.49	7.51**
Pittsburgh	6.38	7.38	8.30	46.00	6.72	...	6.51	7.85	11.90	6.69	6.52	7.64
Portland, Oreg.	7.60	8.75	9.35	48.50	7.85	...	7.55	10.95	14.00	7.50	7.45	9.35
Richmond, Va.	6.43	7.39	8.67	....	6.77	...	6.71	8.33	....	7.08	6.65	8.08
St. Louis	6.67	7.67	8.59	43.89	6.91	...	6.80	7.89	12.19	7.09	6.81	7.93
St. Paul	7.04	8.04	8.96	....	7.28	...	7.17	8.26	....	7.35	7.18	8.30
San Francisco	7.55	8.95	8.70	51.65	7.80	...	7.35	10.05	13.20	7.50	7.40	9.45
Seattle	8.10	9.80	10.15	50.50	8.20	...	7.80	10.95	13.65	7.75	7.80	9.60
Spokane	8.35	9.65†	10.05	....	7.80	...	7.80	10.85‡‡	14.40	7.45	7.55	9.60
Washington	6.70	7.99	7.97	....	7.37	...	7.38	9.09	....	7.31	7.65	8.16

*Prices do not include gage extras; †prices include gage and coating extras, based on 11-cent zinc except in New York, Philadelphia, Los Angeles, Cincinnati, Cleveland (11.50-cent zinc) and in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extra; §as rolled; **⅛-in. and heavier; ††as annealed; ‡‡prices include $2 for crating; §§under ¼-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over, except in Seattle, 2000 to 9999 lb; stainless sheets, 5000 lb except in New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999; ¶—500 to 9999 lb; ¢—4000 lb and over; ¢—1000 to 1999 lb; ¢—1000 lb and over; †—1500 lb to 3999 lb; ¶—f.o.b. local delivery in lots of 10,000 lb and over.

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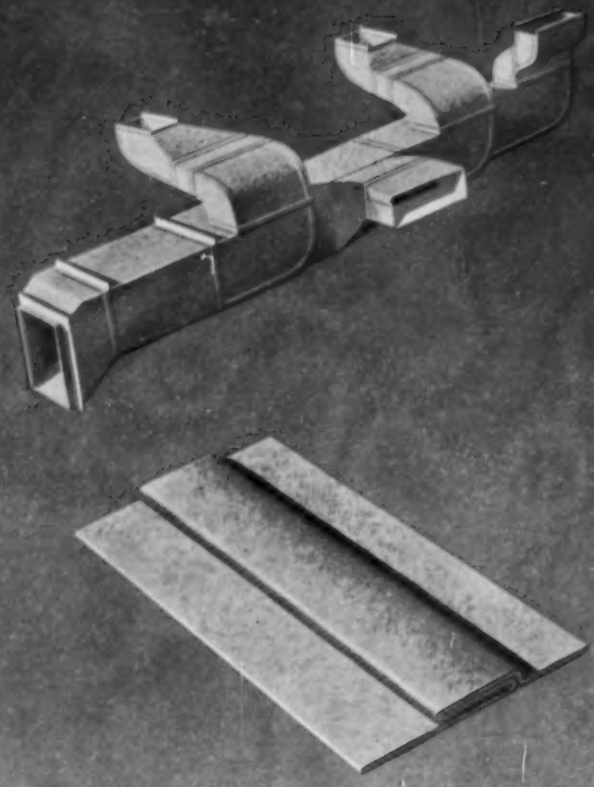

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For gutters, downspouts, air conditioning and furnace ducts, and other applications requiring a durable zinc-coated material, there's no better choice than Weirton galvanized steel—for several reasons.

Weirton galvanized steel has special qualities that stand out over the long run: A tight zinc coating that resists cracking, peeling and flaking . . . better resistance to corrosion . . . exceptional durability—all assured by Weirton's modern plant and processes, and by close control through the entire production cycle.

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Weirton, West Virginia

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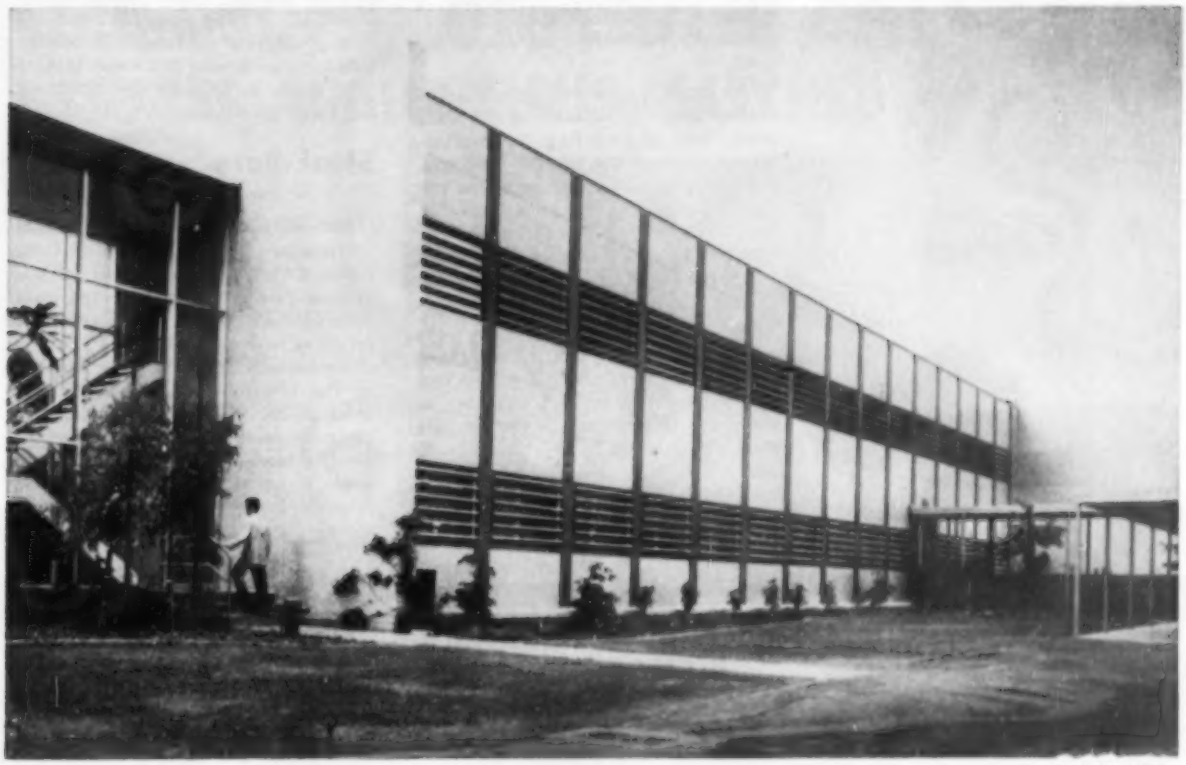

U. S. Steel Corp.

Big construction of small structures boosts an ancient art as . . .

Enameling Sheet Sales Ride Building Boom

"WE'RE SELLING all we can make!" That's the comment of enameling sheet producers, as buildings clad with porcelain enamel sprout up at a rapidly increasing rate.

Steel sheet coated with porcelain enamel is one of several metal building exteriors now enjoying added applications. One reason for sales gains this year in enameling sheet is the growing interest of architects in the wide range of exterior, permanent color in this product. Other advantages are ease of installation and ease of cleaning porcelain enameled building panels.

Small Applications—For 25 or 30 years, porcelain enameled panels have been used in small buildings. Early applications include gas stations and store fronts. U. S. Steel Corp., Pittsburgh, estimates that 30,000 small buildings have employed porcelain enamel exteriors—a solid background for studying possibilities in larger structures.

Gas stations are becoming only a small part of the total demand. Sales managers say there's a tremendous potential in resurfacing old buildings with porcelain enamel panels. In Pittsburgh two buildings (one 75, the other 100 years old) covered with a masonry exterior were refinished with panels. Result is virtually new-looking buildings.

Used Indoors Also—Porcelain enamel panels have interior applications in school halls and chalkboards. Major uses are in exteriors, signs, window sills and frames and theater marquees.

Porcelain enameling as an art is centuries old. In ancient China, gold, copper and brass were enameled. The finished product now, as then, consists of a vitreous inorganic coating fused to a metal base.

Steel Base—Enameling sheet is a carefully refined, extremely flat product—flat to hold its shape in heat of the enameling furnace. It's low carbon steel, usually hot rolled and 16 gage. Several applications require an 18 or 20-gage sheet. During the rolling of the steel sheet, a special roll prepares the sheet to receive the enamel by applying a surface to form a tenacious bond with coating.

The porcelain enamel coating is a mixture of silica, borax, soda, zinc oxide and other inorganic materials. They are melted together at temperatures ranging to 2500 degrees. Immersion in water shatters the molten mixture into light granules.

Applying the Coating—Water, clay and other chemicals join with granules to form "slip." When the mixture is thin enough to pass a 200-mesh screen, it's applied to the steel sheet by dipping or spraying, then passed through a drying oven forming a thin residual coating.

In the enameling furnace, temperatures of about 1600 degrees fuse this coating into the steel surface of the steel, forming an impervious smooth layer. Some applications require only a single coating; others need one or two cover coats. The addition of inorganic materials to the cover coating produces an unlimited range of permanent color.

Production of Panels—Steelmakers sell porcelain enameling sheet to a growing number of firms which fabricate panels and do the enameling. Dozens of companies over the country fabricate panels of enameled sheet.

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REPRESENTATION IN PRINCIPAL CITIES

insulated and backed by light gage galvanized steel sheet or enameling sheet.

One panel producer, Ingram-Richardson Mfg. Co., Beaver Falls, Pa., buys sheet and coating for production of a "sandwich panel." This unit has an outer surface of porcelain enameled sheet and an interior core of various types of insulations. The panel includes an interior wall sheet of galvanized or enameling steel. Panels can also be produced of porcelain enameled aluminum.

Sales Soaring—Among advantages to building owners is that panels can be removed if owners decide to change exterior color. "Sales are growing rapidly," says J. H. E. McMillan, vice president and sales manager of Ingram-Richardson. "It's an expanding market." The size of panels varies, according to gage of metal and the method of attachment to masonry sheathing or structural members.

U. S. Steel officials report a growing trend to use of porcelain-enameled sheet and stainless steel in combination to achieve an attractive exterior. That corporation adds that it is working with designers on over 200 buildings with metal exteriors. Metals used are divided between stainless, porcelain-enameled steel and combinations of the two.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 100

Rolling mills in Seattle open the new year with fair backlogs of orders for reinforcing bars and excellent prospects for new business during the first two quarters. Northwest Steel Rolling Mills Inc. resumed rolling after a two-week shutdown. Reinforcing awards last week totaled 1000 tons. Several sizable contracts are to be placed shortly.

Steel Bars . . .

Bar Prices, Page 100

Hot-rolled bar producers in the Pittsburgh area are pinning their hopes for increased business on numerous predictions of expected good January sales for a wide variety of products using those bars. There is some basis for their brighter outlook in the improvement shown by bar sales so far this year. While gains are not great, the picture is brighter than it was one year ago when inventories were the big question mark. Deliveries in Philadelphia are a little tighter, although averaging in general around three weeks.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 101 & 102

If you want cold-rolled sheets, you probably will have to cool your heels for a while. Almost all order books are filled through the first quarter, and many are opened for second quarter. In fact, mills in the Chicago area report solid bookings into early second quarter, and in the Boston area producers are on an informal allocation basis. April space there is hard to find. There are strong indications of a return to inventory buying by more customers.

Demand is strong also for galvanized sheet, with one eastern producer booked up for first half on continuous hot-dipped and far into second quarter on noncontinuous, 18

Steel Import Prices

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast*
Deformed Bars, Intermediate, ASTM-A-305	$5.30	$5.30	$5.30	$5.58
Bar Size Angles	5.10	5.10	5.10	5.38
Structural Angles	4.65	4.65	4.65	4.93
I-Beams	4.65	4.65	4.65	4.93
Wide Flange Beams	4.80	4.80	4.80	5.08
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.50	5.50	5.50	5.78
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	26.80	27.00	26.80	27.60
Barbed Wire (†)	6.05	6.05	6.05	6.23
Merchant Bars	5.10	5.10	5.10	5.38
Hot-Rolled Bands	5.50	5.50	5.50	5.78
Wire Rods, Thomas Commercial No. 5	5.30	5.30	5.30	5.58
Wire Rods, O-H Cold Heading Quality No. 5	5.75	5.75	5.75	6.03
Bright Common Wire Nails	6.85	6.95	6.90	7.15

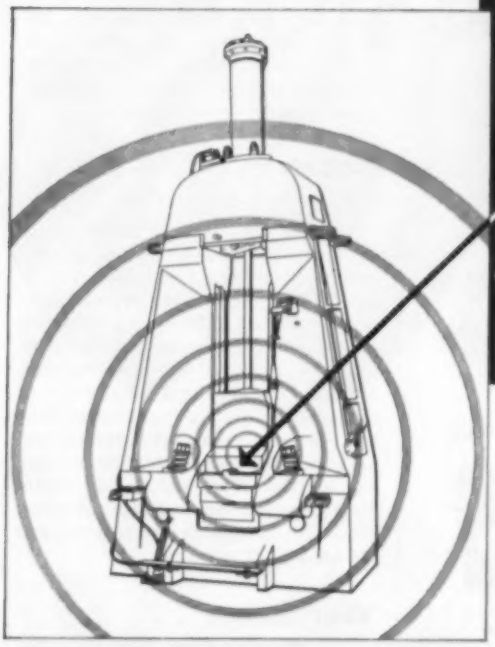
*Not including $2.20 per net ton customarily charged in most West Coast ports for wharfage and handling. †Per 82-lb, net, reel.

Sizes O.D.	Wgt/Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅞ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

CECO-DROP'S LOW CENTER OF GRAVITY ASSURES AGAINST MIS-MATCHED FORGINGS

The center of gravity of the CECO-DROP approximates the center of gravity of the ram at the point of impact, minimizing the fight between the ram and the other parts of the hammer. This gives a more effective blow, preserves die



alignment, which assures fewer rejects, and results in higher production in comparison with other types of hammers.

Write for a copy of Bulletin 57-L-4

CECO-DROP

Made by the BUILDERS of THE IMPACTER

CHAMBERSBURG ENGINEERING CO., CHAMBERSBURG, PA.

gage and lighter. Enameling sheet becoming more active (see p. 107) because of construction requirements. Hot-rolled products are not as critical, delivery ranging up to three and four weeks in Chicago and Philadelphia. Hot-rolled strip is in about the same condition.

Semifinished Steel . . .

Semifinished Prices, Page 100

Kaiser Steel Corp., Fontana Works, Fontana, Calif., will be current with demand in early February, following settlement of a four-day wildcat strike that closed all plants.

Tubular Goods . . .

Tubular Goods Prices, Page 104

Brightness of the tubular products picture depends largely on where you are. Pittsburgh is somewhat on the lighter side while the West Coast is running into trouble. Los Angeles is disturbed by a steady influx of German pipe which is cutting deeply into sales. Farther north, Basalt Rock Co., Kaiser Steel Corp. and Consolidated Western Steel Division of U. S. Steel Corp. are watching developments in the proposed 650-mile, $100-million Pacific Northwest natural gas pipe line. Even though there is some slowness in certain sizes of buttweld tubes, Pittsburgh producers see a pretty good year ahead. They think oil well drilling will hold to 1954 levels or maybe even increase a little.

Stainless Steel . . .

Stainless Steel Prices, Page 104

Republic Steel Corp., Cleveland, advanced its quotations on certain types of stainless steel because of the higher cost of ferroalloys, molybdenum and nickel. Increases ranged from $10 to $15 a ton.

U. S. Steel also raised its prices on alloys containing molybdenum, the increase depending on the amount of moly used.

Stainless Clad Prices Up

Lukens Steel Co., Coatesville, Pa., increased prices on its stainless clad steel plates. The boost reflects recent price hikes for nickel and columbium. The increases run all the way from 10 cents per 100 lb for type 304, 10-per-cent clad, to $2.60 per 100 lb for type 347, 20-per-cent clad. The new prices were effective with shipments on Dec. 29, 1954. For prices on stainless clad plates, see p. 104.

Plates . . .

Plate Prices, Page 100

Demand for plates is slightly better today, the exception being in Chicago. There sheared plate can be had in two weeks and universal mill in three weeks. Elsewhere, prospects are encouraging, mostly because of the possibility of stronger railroad orders and continuing high levels of construction despite the seasonal factor. Several important contracts are to be up for bids in the first quarter on the West Coast. In Pittsburgh, producers indicate January sales should surpass any fourth-quarter month.

Warehouse . . .

Warehouse Prices, Page 105

Most activities in warehouses in January will be inventory taking, which is normal. This will, of course, result in slow business for a while, but there will be a gradual rise as the month moves on. Sheet sales have been the most important factor lately in Pittsburgh, with plate and tube sales slow. Bar sales haven't been bad because mills can't handle small orders on those. In the Pacific Northwest, some price revisions to conform with mill lists are expected soon.

FLORIDA's

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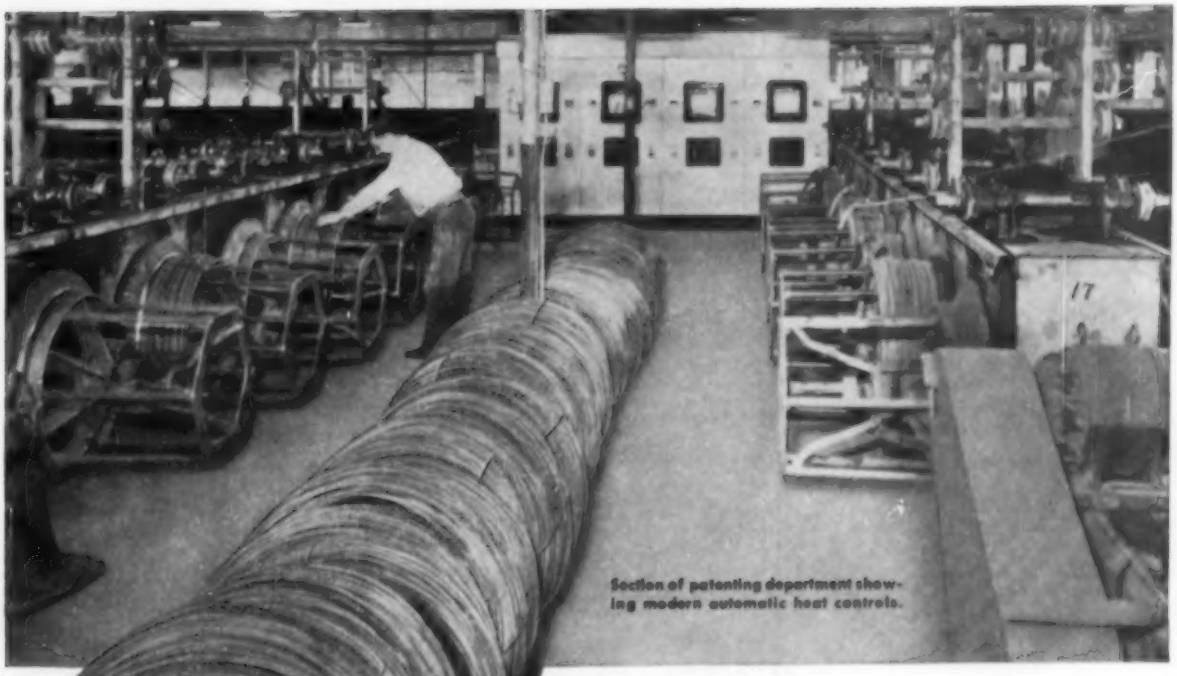

Section of patenting department showing modern automatic heat controls.

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REYNOLDS WIRE	*Dixon, Illinois*	Industrial Wire Cloth
WAGNER LITHO MACHINERY	*Jersey City, N. J.*	Metal Decorating Equipment
WORCESTER WIRE WORKS	*Worcester, Mass.*	Round and Shaped Steel Wire, Small Sizes

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COMPANY

Moen & Connell Avenues
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The Gripco Lock Nut one-piece design gives a tighter more positive holding action for faster application at less cost. And for 50 years the Gripco locking feature has proven itself by an ever increasing use. All-one-piece to cut initial cost—(no inserts, outside devices or complicated features) — the extreme holding or locking action is produced by a simple, vertical thread deflection. For stress, wear or vibration, a Gripco Lock Nut will hold tighter, wear longer. Impervious to oil or water. Write for samples and full details.

GRIPCO PRODUCTS INCLUDE:
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GRIP NUT COMPANY
"after 50 years still holding strong"
308-N S. MICHIGAN AVE., CHICAGO 4, ILL.

Ores

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 57-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	26.50
N. African hematite (spot)	nom. 20.00-22.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite, good commercial quality	$25.00-$26.00
Domestic scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, 90c-92c per long ton unit c.i.f. U. S. ports, duty for buyer's account: 46-47%, 80c.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $40.00-$42.00
48% 3:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$19.00-$20.00
46% no ratio	31.00-32.00

Domestic

(Rail nearest seller)

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb, Mo content mines unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$3.35-$3.85
60-65%	4.00-4.35

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Pueblo, Colo., $94; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $114; Salina, Pa., $119; Niles, O., $125; Los Angeles, Pittsburg, Calif., $137.20.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $120; Warren, Niles, O., Hays, Pa., $125; Morrisville, Pa., $123.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $130; Cutler, Utah, $121.55; Los Angeles, $127.85.

Super Duty: Hays, Sproul, Pa., Warren, Windham, O., Athens, Tex., $137; Morrisville, Pa., Niles, O., $140; Joliet, Ill., $143.

Semisilica Brick (per 1000)

Clearfield, Pa., $130.

Insulating Fire Brick (per 1000)

2300° *F:* Massillon, O. $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick (per 1000)

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., $77.50; Wellsville, O., $81.50; Clearfield, Pa., Portsmouth, O., $87; Perla, Ark., $109; Los Angeles $119.25; Pittsburg, Calif., $111.30.

High-Alumina Brick (per 1000)

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $181; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Clearfield, Pa., $225; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $260; Danville, Ill., $258; Clearfield, Pa., $267.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $147; Clearfield, Pa., $148.50; St. Louis, $159.30; Athens, Tex., $155.

Nozzles (per 1000)

Reesdale, Pa., $234.70; Johnstown, Pa., $240.70; Clearfield, Pa., $241.40; St. Louis, $259.45; Athens, Tex., $247.70; Bridgeburg, Pa., $267.50.

Runners (per 1000)

Reesdale, Pa., Johnstown, Bridgeburg, Pa., $183.50; Clearfield, Pa., $185.50; St. Louis, $195.80; Athens, Tex., $191.80.

Dolomite (per net ton)

Domestic dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Nario, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $15.10; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite (per net ton)

Domestic, dead-burned bulk, ¾-in. grains with fines: Luning, Nev., Chewelah, Wash., $38.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.50-$14.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearny, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.00
Buffalo, deld.	26.25
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.00
Swedeland, Pa., ovens	23.00
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, O., deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol 40 deg. (U.S.P.), tank cars	18.00
e.l. drums	19.00
l.c.l. drums	19.50

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $35-$36; 70%, $32-$33; 60%, $28-$29. Imported, net tons, duty paid, metallurgical grade: European, $28-$30; Mexican, $25.50.

Electrodes

(Threaded with nipple, unboxed f.o.b. plant)

GRAPHITE

Diam.	Length	Per 100 lb
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5⅛	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18, 20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55

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Don't let special steel inventories get out of balance with your current needs. For at your nearby Crucible warehouse you get *prompt* delivery of tool, stainless, alloy and other special steels *when you need them* . . . and in a wide variety of sizes and grades.

So let our nearby warehouse share your inventory load. Prompt shipments from stock will cut high inventory risk without endangering your production schedules. Count on Crucible for all your special steel needs.

Stocks maintained of:

Rex High Speed Steel . . . ALL grades of Tool Steel (including Die Casting and Plastic Die Steel, Drill Rod, Tool Bits, Hollow Drill Steel and Hollow Tool Steel Bars) . . . Stainless Steel (Sheets, Bars, Wire, Billets, Electrodes) . . . Max-el . . . AISI Alloy, Onyx Spring and Special Purpose Steels

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Current Ferroalloy Quotations

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton $56, Palmerton, Pa.; $57 Clairton and Duquesne, Pa.
(16 to 19% Mn) $54 per ton, Palmerton, Pa.; $55 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.). Base price per net ton $190, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, Philo, O.; Sheffield, Ala.; Portland, Oreg., and Tacoma, Wash. Add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $198 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max, 0.07% C, 29.95c per lb of contained Mn, carload packed 30.7c, ton lots 31.8c, less ton 33c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max, 0.30% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carloads, 30c; 2000 lb to min carloads, 32c; 250 lb to 1999 lb 34c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-65%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.00c per lb of alloy, carload packed, 11.75c, ton lots 12.65c, less ton 13.65c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 35-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max, 0.025% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 2.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 5 M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 13.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 12c per pound of contained silicon; 1" x down, bulk 24.90c per pound of contained chromium plus 12.2c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe). Contract, 1" x D; packed, max 0.50%, carload $1.16, ton lots $1.18; less ton $1.20. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 9c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 50-55%, Si 2-3.5% max, C 0.5-1% max), $3.10. **Primos and High Speed Grades** (V 50-55%, Si 1.50% max, C 0.20% max $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.25 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12c per lb of contained Si, carload packed 13.6c, ton lot 15.05c, less ton 16.7c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per pound contained silicon; carload packed 14.85c; ton lots, 16.05c; less ton, 17.4c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.4c per lb of contained Si, carload packed 15.7c, ton lot 16.85c, less ton 18.1c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 17.25c per lb of contained Si, carload packed 18.45c, ton lot 19.4c, less ton 20.45c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe). C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, smaller lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-42%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 25.25c per lb of alloy, ton lot 26c, less ton 27.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min M) $1.50.

Boracil: (3 to 4% B, 40 to 45% Si). $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) Contract, lump, carloads 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.05c per lb of briquet, carload packed 14.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 11.85c per lb of briquet, c.l. packaged 12.85c, ton lot 13.65c, less ton 14.55. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.45c per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.55c per lb of briquet. Packed c.l. 7.55c, ton lot 8.35c, less ton 9.25c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.7c. Packaged c.l. 7.7c, ton lot 8.5c, less ton 9.4c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $12 per lb of contained Cb, less ton $12.05. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $6.25 per lb of contained Cb plus Ta, deld.; less ton lots $6.30.

Silicas Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ⅛" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 45-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 16.6c per lb of alloy; ton lots 18.10c; less ton lots 19.35c, f.o.b. Niagara Falls; freight allowed to St. Louis.

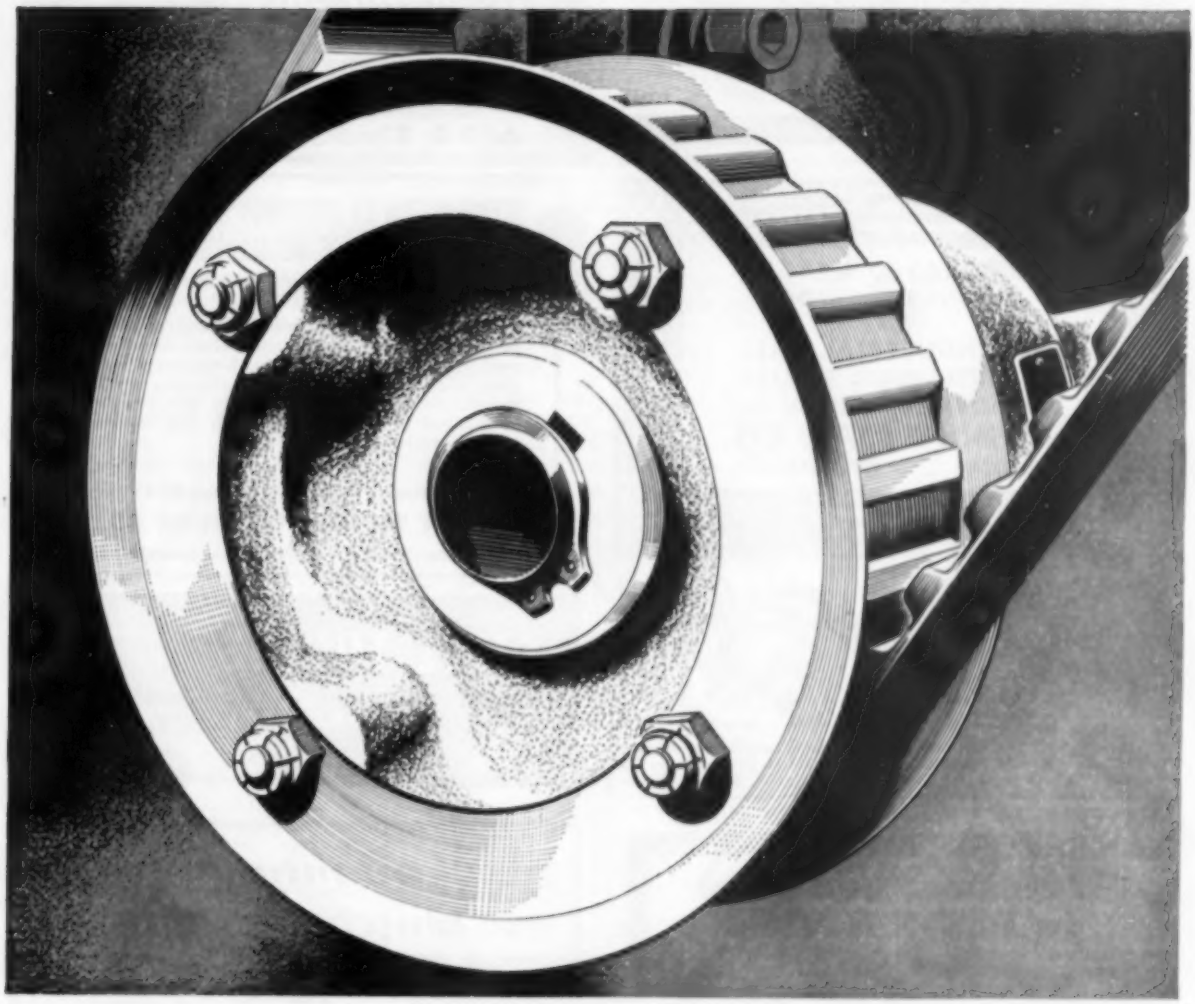
Siminal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 15.50c. Packed c.l. 16.50c, 2000 lb to c.l. 16.75c, less than 2000 lb 17.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo. Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200 lb containers, f.o.b. Langeloth, Pa., $1.46 in all sizes except powdered which is $1.57; Washington, Pa., furnace, any quantity, $1.46.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.25 in cans; in bags, $1.24, f.o.b. Langeloth, Pa.; Washington, Pa., $1.24.

FLEXLOC AT WORK



MORE AND MORE FLEXLOC LOCKNUTS are being used to hold assemblies like this one together. This modern timing belt drive combines the flexibility of a steel cable belt with the positive action of a silent chain drive permitting its use at speeds up to 15,000 rpm.

FLEXLOC Self-Locking Nuts offer the same positive action as the drive. Once the locking threads are fully engaged, the nuts won't work loose, regardless of the vibration encountered. And FLEXLOCS are reusable.

FLEXLOCS are available in a wide range of sizes in any quantity. Stocks are carried by leading industrial distributors everywhere. Write for Bulletin 866 and samples for test purposes. STANDARD PRESSED STEEL CO., Jenkintown 33, Pa.

DO YOU KNOW? Standard FLEXLOCS clean rough threads on bolts, and make them even better. The locking threads on all-metal FLEXLOCS are not chewed up when used on rough bolts.

Standard FLEXLOCS lock securely on bolts varying in diameter tolerances. The all-metal, resilient locking sections of the nut accommodate themselves to the diameter tolerances.

Standard FLEXLOCS are one piece, all metal. They are not affected by temperatures to 550°F. Nuts lacking these features have a more restricted temperature range.

Standard FLEXLOCS lock securely—stopped or seated—when 1½ threads of a standard bolt are past the top of the nut.

Standard FLEXLOCS are not affected by moisture, oil, dirt or grit. They lock efficiently under all conditions, regardless of the vibration encountered.

FLEXLOC®
LOCKNUT DIVISION
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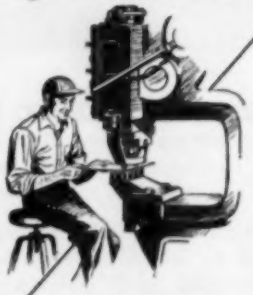

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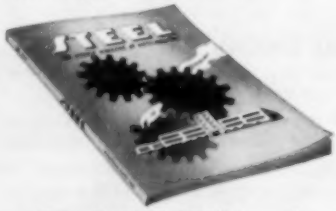

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Scrap . . .

Scrap Prices, Page 118

Philadelphia—Scrap prices are on the buoyant side. Opinion differs on how much of an increase may be expected over the next several weeks. Dealers generally are not pushing sales because they anticipate higher price levels.

Foreign buyers are not pushing too hard for tonnage. They want more scrap but apparently feel that the cost to them is reaching a point where a further survey of the situation is warranted. In addition to the rise in scrap prices here over recent months, ocean freight rates, which European buyers must absorb, have increased about $6 a ton since last September.

At the same time, there is evidence that foreign buyers are still much interested in the market. Of significance is the fact they are still seeking tonnage in the Philadelphia area, where they have to compete with nearby mills.

U. S. Steel Corp.'s Fairless Works, Fairless, Pa., closed on No. 2 heavy melting at $30.50, delivered, and on No. 2 bundles at $26.50. Tonnage was fairly widely distributed, making it somewhat difficult to estimate the total amount; it is believed the volume was moderate. This is the first time Fairless has been in the market for merchant scrap in any quantity in some weeks.

Other price changes in the market here include a rise to $48 on rail crops, while short shovel turnings are slightly easier at $21.

Boston—The steel scrap market is expected to display a firmer price tone with the resumption of buying by domestic consumers. No. 2 bundles are in substantial supply and are quoted below the usual differential with No. 1 bundles. The latter grade is slightly stronger than No. 1 heavy melting steel.

New York—Brokers advanced buying prices on No. 1 heavy melting and No. 1 bundles to $27-$28 and on No. 2 heavy melting to $25-$26. They boosted buying prices on low phos to $30-$31. All other grades are unchanged, but the general undertone is strong. In addition to foreign inquiry, there is a somewhat livelier interest among domestic consumers.

Buffalo—Scrap prices are holding steady here despite 100 per cent steelmaking operations. Dealers are content to ship against recent orders placed at current levels. Lack of buying interest among smaller consumers is a bearish factor. No letup is reported in buying of cast scrap by Canadian interests.

Pittsburgh—Scrap assumed greater strength last week as quotations jumped from $3 to $5 a ton. Growing strength has been noted for several weeks, but the extent of the price rise was surprising. A neighboring mill made the significant purchase, which increased the price of No. 1 heavy melting to $36-$37. Estimates of the size of the order ranged upwards of 5000 tons.

Cleveland—Mills in this district purchased steelmaking grades at prices about 50 cents a ton over previous levels. The upturn in prices is moderated by the large volume of producer scrap that is coming out.

Detroit—The upturn in the steelmaking rate here continues to be more than offset by the increased generation of scrap by the automotive industry. Although slight price adjustments are taking place, major changes in the price picture are not expected until next month when purchases by outside buyers for water shipment begin to influence the picture.

Youngstown — Prices in this important scrap-consuming area advanced nominally because of the recent flurry of activity in Pittsburgh, Chicago and other markets.

No. 1 heavy melting, No. 1 bundles and No. 1 busheling are generally $34 to $35 a ton, with superior grades able to command a premium of $1 or $2 a ton. No. 2 bundles are around $29 to $30, No. 2 heavy melting $30 to $31.

Steel executives are holding an "ace in the hole"—eight district blast furnaces which are out of blast can be put back into service quickly if scrap prices climb too fast.

Chicago—Year-end activity in steelmaking grades of scrap, including a sizable purchase of four grades by an important mill, resulted in an advance of $1 a ton in quotations.

(Please turn to page 120)

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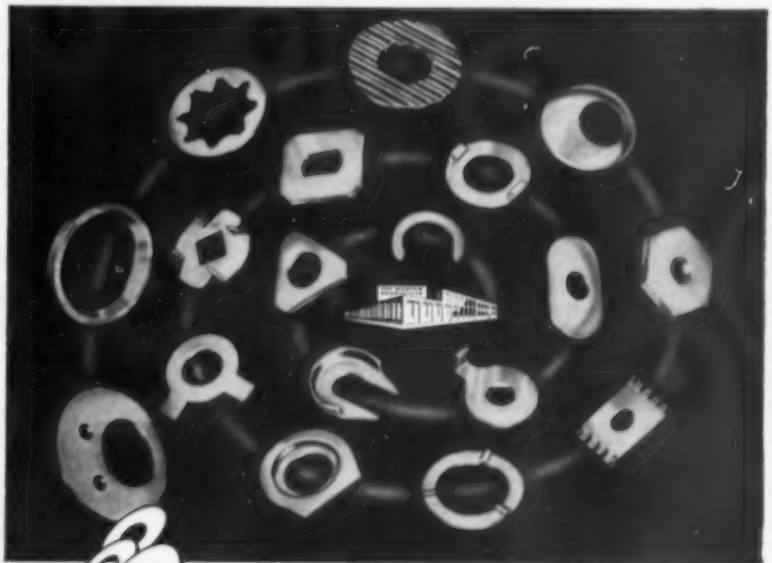

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Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Jan. 5	$34.50
Dec. 29	32.83
Dec. Avg.	32.58
Jan. 1954	29.05
Jan. 1950	26.93

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting	*36.00-37.00*
No. 2 heavy melting	*33.00-34.00*
No. 1 bundles	*36.00-37.00*
No. 2 bundles	*28.00-29.00*
No. 1 busheling	*36.00-37.00*
Machine shop turnings	18.00-19.00
Mixed borings, turnings	18.00-19.00
Short shovel turnings	21.00-23.00
Cast iron borings	21.00-23.00
Cut structurals, 5 ft lengths	*37.00-38.00*
Heavy turnings	29.00-30.00
Punchings & plate scrap	*33.00-39.00*
Electric furnace bundles	*38.00-39.00*

Cast Iron Grades

No. 1 cupola	36.00-37.00
Charging box cast	31.00-32.00
Heavy breakable cast.	30.00-31.00
Unstripped motor blocks	22.00-23.00
No. 1 machinery cast	41.00-42.00

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
Rails, 2-ft and under	46.00-47.00
Rails, 18-in. and under	47.00-48.00
Rails, random lengths	46.00-41.00
Railroad specialties	39.00-40.00

Stainless Steel Scrap

18-8 bundles & solids	185.00-195.00
18-8 turnings	90.00-95.00
430 bundles & solids	85.00-90.00
430 turnings	60.00-62.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	*32.50-33.50*
No. 2 heavy melting	*28.50-29.50*
No. 1 bundles	*32.50-33.50*
No. 2 bundles	*24.50-25.50*
No. 1 busheling	*32.50-33.50*
Machine shop turnings	16.00-17.00
Mixed borings, turnings	20.00-21.00
Short shovel turnings	20.00-21.00
Cast iron borings	20.00-21.00
Low phos.	34.00-35.00
Cut structural plate 2 ft and under	38.00-39.00
Alloy free, short shovel turnings	23.00-24.00
Electric furnace bundles	33.00-34.00

Cast Iron Grades

No. 1 cupola	44.00-45.00
Charging box cast	33.00-34.00
Stove plate	38.00-39.00
Heavy breakable cast.	30.00-31.00
Unstripped motor blocks	30.00-31.00
Brake shoes	31.00-32.00
Clean auto cast	44.00-45.00
No. 1 wheels	37.00-38.00
Burnt cast	29.00-30.00
Drop broken machinery	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00
R.R. malleable	44.00-45.00
Rails, 3-ft and under	46.00-47.00
Rails, 18-in. and under	47.00-48.00
Rails, random lengths	43.00-44.00
Cast steel	36.00-37.00
Railroad specialties	36.00-37.00
Uncut tires	37.00-38.00
Angles, splice bars	42.00-43.00
Rails, rerolling	52.00-53.00

Stainless Steel (Brokers' Buying Prices)

18-8 bundles, solids	190.00-200.00
18-8 turnings	80.00-90.00
430 clips, bundles, solids	80.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	*30.00-31.00*
No. 1 bundles	34.00-35.00
No. 2 bundles	*29.00-30.00*
No. 1 busheling	*34.00-35.00*
Machine shop turnings	14.00-15.00
Short shovel turnings	22.00-23.00
Cast iron borings	22.00-23.00
Low phos.	36.00-37.00
Electric furnace bundles	35.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00

CHICAGO

No. 1 heavy melting	*34.00-36.00*
No. 2 heavy melting	*32.00-33.00*
No. 1 factory bundles	*36.00-37.00*
No. 1 dealer bundles	33.00-34.00
No. 2 bundles	*24.00-25.00*
No. 1 busheling	*34.00-36.00*
Machine shop turnings	*17.00-18.00*
Mixed borings, turnings	*19.00-20.00*
Short shovel turnings	*19.00-20.00*
Cast iron borings	*19.00-20.00*
Cut structurals, 3 ft	36.00-37.00
Punchings & plate scrap	*37.00-38.00*
Electric furnace bundles	*36.00-37.00*

Cast Iron Grades

No. 1 cupola	39.00-41.00
Stove plate	34.00-35.00
Unstripped motor blocks	26.00-27.00
Clean auto cast	44.00-45.00
Drop broken machinery	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt	*38.00-39.00*
R.R. malleable	*44.00-45.00*
Rails, 2-ft and under	50.00-51.00
Rails, 18-in. and under	51.00-52.00
Angles, splice bars	43.00-44.00
Rails, rerolling	52.00-54.00

Stainless Steel Scrap

18-8 bundles & solids	*190.00-195.00*
18-8 turnings	75.00-80.00
430 bundles & solids	*70.00-75.00*
430 turnings	*35.00-40.00*

Chicago Mercantile Exchange

(Week ended Jan. 5)
No. 1 Heavy Melting

	High	Low	Close
Jan.	36.50	34.875	34.975
Mar.			36.50*

No. 2 Heavy Melting

Feb.			33.125*

Sales (40-ton Units): 10 January.
*Nominal.

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	27.00
No. 2 heavy melting	19.00
No. 1 bundles	27.00
No. 2 bundles	18.00
No. 1 busheling	26.00
Machine shop turnings	11.00
Mixed borings, turnings	11.00
Short shovel turnings	*15.00*
Punchings & plate scrap	29.00

Cast Iron Grades

Charging box cast	27.00
No. 1 cupola	34.00
Stove plate	30.00
Heavy breakable	25.00
Unstripped motor blocks	20.00
Clean auto cast	35.00
Malleable	30.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	31.00-32.00
No. 2 bundles	20.00-21.00
No. 1 busheling	31.00-32.00
Machine shop turnings	*12.00-14.00*
Mixed borings, turnings	17.00-18.00
Short shovel turnings	17.00-18.00
Cast iron borings	17.00-18.00
Low phos. 18-in.	*37.00-38.00*

Cast Iron Grades

No. 1 cupola	39.00
Heavy breakable cast.	35.00
Charging box cast	36.00
Drop broken machinery	45.00

Railroad Scrap

No. 1 R.R. heavy melt.	33.00-34.00
Rails, 18-in. and under	46.00-47.00
Rails, random lengths	38.00-39.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	31.50-32.50
No. 2 heavy melting	*30.50*
No. 1 bundles	31.50-32.50
No. 2 bundles	*26.50-27.00*
No. 1 busheling	30.00-30.50
Electric furnace bundles	33.50
Machine shop turnings	18.00
Mixed borings, turnings	19.00-19.50
Short shovel turnings	*21.00*
Structurals & plate	34.50-35.00
Heavy turnings	29.50-30.00
Couplers, springs, wheels	25.00
Rail crops, 2 ft & under	*48.00*

Cast Iron Grades

No. 1 cupola	35.00
Malleable	41.50-42.00
Heavy breakable cast.	36.00-36.50
Drop broken machinery	42.00-43.00

*Nominal.

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*27.00-28.00*
No. 2 heavy melting	*25.00-26.00*
No. 1 bundles	*27.00-28.00*
No. 2 bundles	20.00-21.00
Machine shop turnings	10.00-10.50
Mixed borings, short turnings	11.00-12.00
Low phos. (structural & plate)	*30.00-31.00*
Short shovel turnings	12.00-13.00

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	22.00-23.00

Stainless Steel

18-8 sheets, clips, solids	175.00-180.00
18-8 borings, turnings	75.00-80.00
430 sheets, clips, solids	55.00-60.00
410 sheets, clips, solids	45.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	23.00-23.00
No. 2 heavy melting	*18.50-19.00*
No. 1 bundles	23.00-24.00
No. 2 bundles	*16.25-17.00*
Mixed borings, turnings	9.50-10.00
Machine shop turnings	*8.00-8.50*
Short shovel turnings	10.50-11.00
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	32.00-33.00

BUFFALO

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	27.50-28.50
No. 1 bundles	30.00-31.00
No. 2 bundles	25.50-26.50
No. 1 busheling	30.00-31.00
Machine shop turnings	18.00-19.00
Mixed boring, turnings	20.00-21.00
Short shovel turnings	21.00-22.00
Cast iron borings	20.00-21.00
Low phos.	33.00-34.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	38.00-39.00
No. 1 machinery	43.00-44.00

Railroad Scrap

Rails, random lengths	35.00-36.00
Rails, 3 ft and under	42.00-43.00
Railroad specialties	36.50-37.50

BIRMINGHAM

No. 1 heavy melting	26.00-27.00
No. 2 heavy melting	24.00-25.00
No. 1 bundles	23.00-24.00
No. 2 bundles	19.00-20.00
Cast iron borings	16.00-17.00
Short shovel turnings	16.00-17.00
Machine shop turnings	15.00-16.00
Electric furnace bundles	29.00-30.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	45.00-46.00
Stove plate	42.00-43.00
Bar crops and plate	33.00-34.00
Structural plate, 2 ft	33.00-34.00
Unstripped motor blocks	35.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt.	*32.00-33.00*
Rails, 18-in. and under	40.00-41.00
Rails, rerolling	40.00-41.00
Angles, splice bars	38.00-39.00
Stand. steel axles	35.00-36.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	30.00
No. 2 heavy melting	28.00
No. 1 bundles	30.00
No. 2 bundles	*23.75*
Machine shop turnings	13.00
Short shovel turnings	15.00

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	32.50
Heavy breakable cast.	32.50
Unstripped motor blocks	32.50
Brake shoes	30.00
Clean auto cast	41.00
Stove plate	*36.50*

Railroad Scrap

No. 1 R.R. heavy melt.	*35.50*
Rails, 18-in. and under	46.00
Rails, random lengths	43.00-44.00
Rails, rerolling	50.00
Angles, splice bars	39.00-40.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	27.00
No. 2 heavy melting	23.00
No. 1 bundles	21.00
No. 2 bundles	17.00
No. 3 bundles	13.00
Machine shop turnings	13.00
Mixed borings, turnings	13.00
Short shovel turnings	12.00
Electric furnace, No. 1	32.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	32.00-35.00
Heavy breakable cast.	23.00
Unstripped motor blocks	25.00
No. 1 wheels	31.00
Stove plate (f.o.b. plant)	28.00
Brake shoes	28.00

Railroad Scrap (Delivered consumer plant)

Rails, random lengths	30.00-34.00

LOS ANGELES

No. 1 heavy melting	20.00
No. 2 heavy melting	16.00
No. 1 bundles	20.00
No. 2 bundles	16.00
Machine shop turnings	5.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	42.00-44.00

SAN FRANCISCO

No. 1 heavy melting	24.00
No. 2 heavy melting	20.00
No. 1 bundles	23.00
No. 2 bundles	18.00
No. 1 busheling	24.00
Machine shop turnings	6.00
Mixed borings, turnings	6.00
Short shovel turnings	9.00
Cast iron borings	9.00
Cut structurals	25.00
Heavy turnings	9.00
Punchings & plate scrap	25.00
Electric furnace bundles	19.00

Cast Iron Grades

No. 1 cupola	*40.00*
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast.	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	48.00

HAMILTON, ONT.

(Delivered prices)

No. 1 heavy melting	26.00
No. 2 heavy melting	23.00
No. 1 bundles	26.00
No. 2 bundles	21.00
Mixed steel scrap	20.00
Mixed borings, turnings	12.00
Rails, remelting	35.00
Busheling, new factory: Prepared	24.00
Unprepared	20.00
Short steel turnings	12.00

Cast Iron Grades†

No. 1 machinery cast	42.00-45.00

†F.o.b., shipping point.

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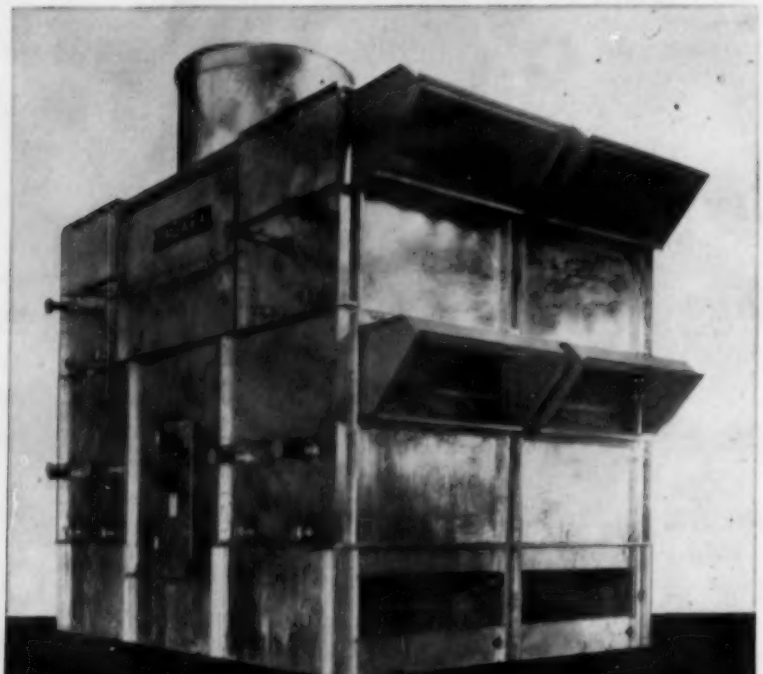

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(*Concluded from page* 117)

Included in the transaction were No. 1 heavy melting steel at $36, delivered; No. 1 factory bundles, at $37; No. 2 heavy melting, at $33; and No. 2 bundles, at $25. The order calls for January delivery.

Los Angeles—Despite 1954's lagging sales charts, dealers are getting some comfort from reports that mills are beginning to show renewed interest in specifications.

San Francisco—No. 1 cupola cast dropped $3 a ton to $40, reflecting seasonal contraction in demand at a time when supplies have gained. Dealers in this area estimate their handlings of steel and iron scrap in 1954 were 35 per cent under the total 1953 deliveries.

Seattle—The scrap market is firm and unchanged. Some dealers look for higher price levels in the near future because neither steel nor cast iron is plentiful.

Pig Iron . . .

Pig Iron Prices, Page 105

Practically all areas report better pig iron business in January than in December, and December wasn't a bad month itself. Foundries are carrying low inventories so that current business is quickly reflected in their demand for pig iron. In some cases, shops are attempting to better their inventory position, which may account for some of the optimism. In the Chicago district, where automotive demands continue strong and implement makers are becoming active, 36 of 43 blast furnaces are operating. In Birmingham, the Tennessee Coal & Iron Division of U. S. Steel Corp. will close down its No. 7 blast furnace for relining and general repairs about mid-January. It will be down 65 days, but the company's ingot production rate will not be affected. The first-quarter price for Mystic furnace iron at Everett, Mass., will remain at $61 per gross ton, f.o.b. cars, furnace, for No. 2 foundry, with usual differentials.

Structural Shapes . . .

Structural Shape Prices, Page 100

Structurals remain active all over the country, with strength coming from construction and competition. American Institute of Steel Construction reports total shipments for first 11 months of 1954 were 2,909,286 tons, compared with 2,850,785 tons during the like 1953 period.

Earlier the institute estimated that 1954 shipments of fabricated structural steel would be the highest since the 1929 peak. Bookings

for November lagged behind the year-ago pace, however, and the backlog was off the 1953 level.

In New England, structural fabricators are doing bridge work, which is a postwar development. Several estimate contracts up to 1000 tons. But the largest contract in that area is for a foundry building for Bullard Co., Bridgeport, Conn., which will take 3000 tons. Another significant development in that area is the awarding of the first contract for offshore radar platforms, "Texas Towers," to be built at Bethlehem Steel Corp.'s Quincy, Mass., shipyard. It will take 1800 tons of structurals, plus plates and seamless pipe for anchorage at sea. Five platforms will be required for East Coast installation.

On the West Coast, The Dalles dam continues to consume structurals, and the Washington state highway work is furnishing considerable business for fabricators. Bids will be opened Jan. 18 for the First avenue south bascule span in Seattle, involving 1750 tons. Competition for all this work is extremely keen.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 112

Gray iron foundries in Chicago are buying coke freely this month to match melting schedules. With fuel available on a prompt delivery basis, inventories are purposely held at the minimum.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

10,025 tons, superstructure, east viaduct, contract N-22, Jersey City, N. J., through New Jersey Turnpike Authority, to Baldwin-Lima-Hamilton Corp., Eddystone, Pa.

3000 tons, foundry building, Bullard Co., Bridgeport, Conn., to American Bridge Division, U. S. Steel Corp., Pittsburgh; Edwin Moss & Sons, Bridgeport, general contractors.

2700 tons, power plant, American Gas & Electric Service Corp., Glenlyn, Va., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

2000 tons, cellophane plant, DuPont interests, Kern, Ind., to Bethlehem Fabricators Inc., Bethlehem, Pa.

1800 tons, Texas tower, off-shore radar platform, Navy department, to Quincy yard, Bethlehem Steel Co., Bethlehem, Pa.

1800 tons, stop logs, lifting beams, etc., The Dalles dam, to Gundert & Zimmerman, Stockton, Calif., low $395,196, by U. S. Engineer, Portland, Oreg.

855 tons, seven state bridges, Greenwich-Killingly Expressway, Westbrook, Conn., to Elizabeth Iron Works, Elizabeth, N. J., through L. G. DeFelice & Sons, North Haven, Conn., general contractor.

809 tons, state highway work, Bronx county, New York, through Rusciano and Delbaso, operating jointly on the general contract, to Central Iron Works, Bronx, New York.

800 tons, Cousins Island bridge, Yarmouth, Me., to Bancroft & Martin Rolling Mills Co., South Portland, Me., through Ellis C. Snodgrass Inc., Portland, general contractor.

640 tons, state highway project, Queens county, New York, through Tully & DiNapoli Inc., general contractor, to Harris Structural Steel Co., New York.

620 tons, four single-span rolled beam bridges, Greenwich-Killingly expressway, Norwalk, Conn., to Bethlehem Steel Co., Bethlehem, Pa.

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Man, experienced in the commercial knife field (wood, metal and paper) for field representative—considerable traveling—representing leading manufacturer. Ideal working conditions. Salary and expenses. Give complete details in first letter. Address Box 191, STEEL, Penton Building, Cleveland 13, Ohio.

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PLANT AND PRODUCTION MANAGER. Engineering Graduate (M.I.T.) indoctrinated in practical operating experience. Proven record of accomplishment in efficient plant supervision, control, and cost reduction coupled with amicable labor relations. Reply Box 134, STEEL, Penton Building, Cleveland 13, Ohio.

EXPERIENCED FORGING ENGINEER AVAILABLE. Expert in hand tools and railroad work production, design and management. Willing to travel. Passport in order. Reply Box 145 STEEL, Penton Building, Cleveland 13, Ohio.

Help Wanted

ASSISTANT SUPERINTENDENT
Cold Drawn Mill in East has opening for young man 23-30, graduate of college or technical school. Should have some engineering and production line experience. Replies will be held confidential. Reply Box 188, STEEL, Penton Building, Cleveland 13, Ohio.

SALES ENGINEER—experienced and having contacts in Sand Blasting Equipment and Dust Arrester field. Excellent opportunity, compensation open. Old established medium size company, new modern plant. Reply in detail. Information given will be held confidential. Reply Box 189, STEEL, Penton Building, Cleveland 13, Ohio.

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Pa.; Paul Bacco Co., Stamford, Conn., general contractor.

350 tons, two elementary school buildings, Westerly, R. I., to Providence Steel & Iron Co., Providence, R. I., structurals; reinforcing steel, through Gilbane Building Corp., Providence, general contractor, to Norwich Steel & Supply Co., Norwich, Conn.

340 tons, building, Gerald O. Kaye, Maspeth, N. Y., through Brown & Matthews, general contractors, to Bethlehem Fabricators Inc., Bethlehem, Pa.

340 tons, state bridge, Delaware county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.

275 tons, junior and senior high school, Central Islip, N. Y., through Scarsdale Contracting Co., general contractor, to Rubin & Cohen Iron Works, Mt. Vernon, N. Y.

230 tons, building addition, Smith, Kline & French, Philadelphia, to Cantley & Co., that city.

225 tons, public school No. 209, Queens, New York, through Peaty-Fuhrman Inc., contractor, to Bethlehem Fabricators Inc., Bethlehem, Pa.

225 tons, school alterations and additions, New Paltz, N. Y., through Eugene Ossie, general contractor, to Poughkeepsie Iron & Metal Co., Poughkeepsie, N. Y.

205 tons, four-span beam bridge, Dover, N. H., to Lyons Iron Works, Manchester, N. H.; W. H. Hinman Inc., North Anson, Me., general contractor.

175 tons, Pepsi-Cola bottling plant, Philadelphia, to Belmont Iron Works, Eddystone, Pa.

155 tons, building, Esso Standard Oil Co., Linden, N. J., through Walter Kidde Construction Co., general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

155 tons, manufacturing building, Bridgeport Brass Co., Bridgeport, Conn., to Leake & Nelson Co., New Haven, Conn., through E & F Construction Co., Bridgeport, general contractor.

120 tons, tower of chimes, Paramus, N. J., through William Crawford Inc., general contractor, to Bergen Iron & Engineering Co., Rutherford, N. J.

115 tons, building, Federal Prison Vocational School, Lewisburg, Pa., to Belmont Iron Works, Eddystone, Pa.

STRUCTURAL STEEL PENDING

1750 tons, also 65 tons reinforcing, including steel deck and machinery, Washington state First avenue bascule bridge, Seattle; bids to Olympia, Jan. 18.

1725 tons, nine-span steel stringer bridge, Brimfield-Palmer, Mass.; bids Jan. 11, Massachusetts Turnpike Authority, Boston.

1245 tons, state highway bridges, Carlton-Oxford-Auburn, Mass.; bids to Massachusetts Turnpike Authority, Boston.

1050 tons, Route 42, section 12-B, North-South Freeway, Camden county, New Jersey; bids Feb. 3.

395 tons, four bridges, Warren-Brimfield-Sturbridge, Mass., Massachusetts Turnpike Commission, Boston; L. G. DeFelice & Sons, North Haven, Conn., low, general contract; also 495 tons, reinforcing.

350 tons, National Guard air armory, Portland, Oreg.; Robert E. McKee, Los Angeles, low $918,618, to U. S. Engineer, Portland, Oreg.

310 tons, Masonic Memorial Hospital, Elizabethtown, Pa.; Irvin & Leighton, Philadelphia, low on general contract.

225 tons, Washington state Nooksack river bridge; general contract to Rumsey & Co., Seattle, low $391,741.

100 tons plus, two spans Denali highway, Alaska; Peter Kiewit Sons Co., Seattle, low $440,320, to Alaska Road Commission.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2200 tons, Tampa Bay bridge, Tampa-St. Petersburg, Fla., to Florida Steel Products Co., Tampa, through Hardaway Construction Co., Columbus, Ga., general contractor; 70 tons structural steel, to Bushnell Steel Co., Tampa.

620 tons, addition to pulp and paper plant Potlatch Forests Inc., Lewiston, Idaho, to Bethlehem Pacific Coast Steel Corp., Seattle.

300 tons, Skyland apartments, Queen Anne district, Seattle, to Northwest Steel Rolling Mills Inc., Seattle.

100 tons, Duwamish substation for Seattle Light department, to Joseph T. Ryerson & Son Inc., Seattle.

REINFORCING BARS PENDING

930 tons, highway bridges, Carlton-Oxford-Auburn, Mass.; bids to Massachusetts Turnpike Authority, Boston.

745 tons, highway bridges, Weston-Natick-Wayland, Mass., Massachusetts Turnpike Authority, Boston; B. Perini & Sons, Framingham, Mass., general contractor.

600 tons, Washington state box girder bridge, Grays Harbor county; bids to Olympia, Jan. 18.

540 tons, Quoboag Valley bridge, nine span steel stringer, Brimfield-Palmer, Mass.; bids Jan. 11, Massachusetts Turnpike Authority, Boston.

366 tons, Route 42, section 12-B, North-South Freeway, Camden county, New Jersey; bids Feb. 3.

175 tons, state highway bridge, Cousins Island, Yarmouth, Me.

135 tons, Washington state undercrossing, Spokane county; bids to Olympia, Jan. 18.

100 tons or more, Bureau of Public Roads bridge, Mt. Hood national forest; Morrison-Knudsen Co., Seattle, low $326,643.

PLATES . . .

PLATES PLACED

2515 tons, four tanks, Consolidated Edison Co., Brooklyn, N. Y., to Hammond Iron Works, Warren, Pa.

200 tons, 750,000-gal., water storage tank, for Vancouver, Wash., to Pittsburgh-Des Moines Steel Co., Seattle, low $111,574.

125 tons, tanks and fire walls, Edgewater terminal, Edgewater, N. J., through Otto J. Sambach, general contractor, to Hammond Iron Works, Warren, Pa.

PLATES PENDING

275 tons, all-welded steel, twin-propeller, diesel-powered, shallow-draft tow boat, Union Barge Corp., Pittsburgh; alternate bids on one or two identical boats.

200 tons, one million-gal., storage tank; bids to King County Water District No. 74, Seattle, Jan. 5; H. T. Harstad, Seattle, engineer.

PIPE . . .

CAST IRON PIPE PLACED

335 tons, 6 and 8 in., Newton, Mass., to Warren Pipe Co., Everett, Mass.

300 tons, 10 and 14 in., North Attleboro, Mass., to Warren Pipe Co., Everett, Mass.

200 tons, 6 to 12 in., Stoneham, Mass., to Warren Pipe Co., Everett, Mass.

200 tons, 6 to 12 in., Cambridge, Mass., to Warren Pipe Co., Everett, Mass.

175 tons, 16 in., Burlington, Vt., to Warren Pipe Co., Everett, Mass.

135 tons, 12 in., Waltham, Mass., to R. D. Wood & Co., Florence, N. J.

CAST IRON PIPE PENDING

900 tons, 6 to 12 in., Worcester, Mass.; bids in.

300 tons, 8 to 12 in., South Hadley, Mass.

300 tons, 24 in., West Springfield, Mass.; bids Jan. 10.

250 tons, 6 and 4 in.; bids in at Bellingham, Wash., Jan. 3.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Baltimore & Ohio, 36 diesel-electric units, placed; sharing in distribution are Electro-Motive Division, General Motors Corp., La Grange, Ill.; Baldwin-Lima-Hamilton Corp., Eddystone, Pa.; American Locomotive Co., New York; and Fairbanks-Morse & Co., Chicago.

RAILROAD CARS PLACED

Baltimore & Ohio, 100 seventy-ton flat cars, to own shops, DuBois, Pa.

RAILROAD CARS PENDING

Delaware, Lackawanna & Western, fifty 75-ft flat cars for piggy-back service; bids asked.

Southern Railway, 1000 fifty-ton steel-sheathed boxcars; bids asked.

RAILS PLACED

Delaware, Lackawanna & Western, 5000 tons, to U. S. Steel Corp., Pittsburgh, and Bethlehem Steel Co., Bethlehem, Pa.

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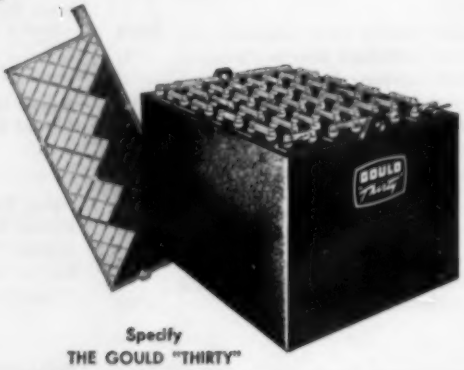

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FARVAL—
Studies in Centralized Lubrication
No. 163

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This Kane & Roach Vertical Angle Bender is an excellent example of how one modern machinery builder protects his equipment from "human" error. According to this builder, the cost of just *one* shutdown due to haphazard lubrication would exceed the entire cost of its protective Farval system. With Farval installed, this machine can perform efficiently, with no danger of bearing failure. In addition, Farval saves oiling labor and lubricant!

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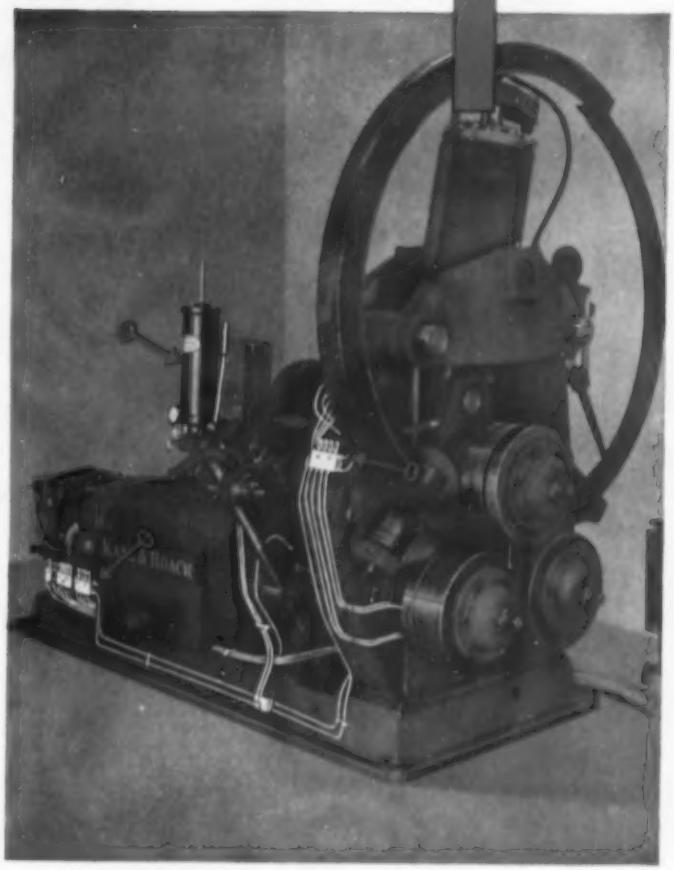

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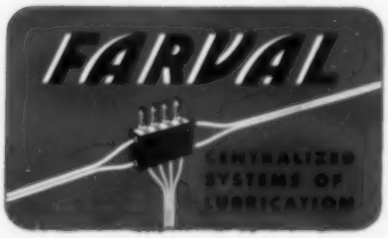

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